Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Detailed Site Investigation (Contamination)

Proposed Residential Development
871 – 877 Pacific Highway, Chatswood

Prepared for
Megland Group Pty Ltd

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
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Report on Detailed Site Investigation (Contamination)
Proposed Residential Development
871 – 877 Pacific Highway, Chatswood

1. Introduction

This report presents the results of a Detailed Site Investigation (Contamination) undertaken for a proposed residential development at 871 – 877 Pacific Highway, Chatswood. The work was commissioned by Megland Group Pty Ltd, developer, in consultation with PBD Architects.

The project involves the construction of a six to seven-storey residential unit building over a two level basement. The new building will cover the majority of the site and it is expected that there will be limited access to subsurface soils. Most or all of the existing filling and soil will be excavated to form the basement.

The detailed contamination assessment was undertaken to:

- Assess the general levels of soil contamination resulting from past and present activities on the site;
- Assess the potential for contaminant migration by examining the groundwater quality on the site;
- Assess the suitability of the site for the proposed residential development; and
- Provide recommendations for remediation works, if required.

The Detailed Site Investigation (DSI) was undertaken to address the requirements of *State Environmental Planning Policy No 55 – Remediation of Land*. The overall approach for the DSI included a review of available historical information, the drilling of boreholes, the installation of groundwater monitoring wells, soil sampling, laboratory analysis and interpretation of the results. Details of the site history, field work and laboratory testing programme are given in this report, as well as comments on the issues outlined above.

The report has not specifically been prepared for review by a Site Auditor.

2. Site Description

The site is irregular in plan and covers an area of approximately 1400 m^2. It is bounded by a service station to the north, Wilson Street to the south, a rail corridor to the east and the Pacific Highway to the west. The site is relatively flat, with surface levels in the vicinity of RL 108 m relative to the Australian Height Datum (AHD). The eastern boundary of the site is supported by a retaining wall approximately 6 m high, above the rail tracks. At the time of investigation the site was occupied by a two storey mixed residential and office building, and open vehicle parking areas.

The site is legally known as Lot 1 in SP 17870. The boundary of the assessment is shown in Figure 1.

Figure 1: Location of 871 – 877 Pacific Highway, Chatswood

3. Regional Geology and Hydrogeology

The Geological Survey of NSW 1:100,000 Geological Series Sheet 9130 (Sydney) indicates that the site is underlain by Ashfield Shale, which typically comprises black to dark grey shale and laminite. The corresponding Soil Landscape Series Sheet, by the former NSW Department of Land and Water Conservation, indicates that bedrock at the site is overlain by erosional soils of the Glenorie soil association, typically comprising red and yellow, moderately reactive clay soils.

The regional groundwater table is likely to be well below the bedrock surface. This is based on the fact that the railway cutting to the east of the site is dry.

4. Scope of Works

The scope of the DSI was as follows:

- Review various historical documents including title deeds, the S 149 Certificate, aerial photographs, EPA Remediation Notices and groundwater bore licences to determine the nature of previous activities that may have occurred on the site;
- Prepare a Sampling and Analysis Quality Plan (SAQP) for the investigation;
- Drill seven boreholes (BH1 to BH7) on the site at accessible locations;
- Install two temporary groundwater monitoring wells (BH1 and BH2) to allow an assessment of groundwater quality to be made;
- Collect soil and groundwater samples for analysis at a NATA accredited laboratory for a range of potential contaminants;
- Screen soil samples with a calibrated Photoionisation Detector (PID) to assess the presence of volatile organic compounds;
- Provide a DSI report which comments on the recorded levels of contamination in the soils and groundwater on the site, the suitability of the site for the proposed development and recommended follow up action; and
- Store remaining soil and groundwater samples not analysed for a period of one month pending the need for further analysis.

5. Site History

5.1 Historical Land Uses

The title deed records indicate that the site has been owned by various parties between 1914 and the present date. The site appears to have been used for residential purposes up until the 1970s when it was developed for commercial use. There is nothing in the land title information to suggest that obviously contaminating activities have been undertaken on the site in the past. A summary of the title deed records is provided in Appendix C.

5.2 Aerial Photographs

A review of available aerial photographs from 1930, 1956, 1961, 1970, 1986, 1991, 2002 and 2014 was undertaken to evaluate the changes in land-use patterns on the site during this period. The 1930 photograph shows that the site is occupied by two or three residential dwellings. The 1956 and 1961 photographs show similar conditions to that of 1930.

The 1970 photograph shows that the site to the north has been redeveloped and it appears as though the residences have either been reconfigured or demolished/rebuilt into larger buildings. The 1986 and 1991 photographs show similar conditions to that of 1970. The 2002 and 2014 photographs show similar conditions to those observed at the time of the current investigation.

Scanned images of the aerial photographs are provided in Appendix C.

5.3 Section 149 Planning Certificate

A Section 149 Planning Certificate issued under the *Environmental Planning & Assessment Act 1979* was obtained for the site from Willoughby City Council. The certificate does not contain any information in relation to orders issued under the *Contaminated Land Management Act 1997*.

The planning certificate is included in Appendix C.

5.4 Contaminated Land Public Register

A search undertaken on 2 April 2015 indicated that the development site is not on the Public Register of Notices issued under the *Contaminated Land Management Act 1997*.

5.5 Groundwater Bore Licences

A search of licensed groundwater bores within the Chatswood area indicated that no licensed groundwater wells are present within 1 km of the site.

6. Conceptual Site Model

The available site history information indicates that the site may have originally been used for residential purposes prior to redevelopment into commercial premises in the 1970s. The site immediately to the north is a Shell service station, a railway corridor is located immediately to the east, and roads are located to the south and west.

The Conceptual Site Model (CSM) has therefore been developed on the basis of the information currently available. Potential soil contamination may be present as a result of:

- The placement of filling on the site during previous redevelopment works;

- Hazardous building materials such as asbestos, lead-based paints, polychlorinated biphenyls (PCBs) etc. associated with previous demolition activities;
- Contaminants associated with vehicles (e.g. fuel, oil, solvents etc.);
- Contaminants associated with service stations that may have migrated onto the site (e.g. fuel);
- Contaminants associated with maintenance of the buildings on the site (e.g. pesticides etc.); and
- Naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals).

Potential groundwater contamination may be present as a result of:

- Contaminants associated with vehicles (e.g. fuel, oil, solvents etc.);
- Contaminants associated with service stations that may have migrated onto the site (e.g. fuel);
- Contaminants associated with maintenance of the buildings on the site (e.g. pesticides etc.);
- Naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals); and
- Migration of diffuse sources of contamination onto the site.

Soil vapour intrusion and/or ground gas is currently considered to be a very low risk on the site and will only be considered if significant concentrations of volatile contaminants are encountered during the assessment.

The human receptors to soil and groundwater contamination are likely to be the occupants of and visitors to the proposed building. Construction personnel and nearby workers may also be receptors during the construction phase of the development project.

The ecological receptors are likely to be limited to the flora and fauna that grow/live on areas of the site in areas which vegetation is proposed. The area is not known to be ecologically significant.

Exposure pathways are expected to be limited to dermal contact with soils and groundwater on the site by humans, ingestion of soils and vegetation by fauna, and phytotoxic exposure to flora.

7. Selected Comparative Guidelines

The *National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater* (NEPC, 2013) provides assessment levels for various soil, groundwater and vapour contaminants. The site is assumed to be a residential site with limited access to soil for the health-based components of the assessment. Ecological-based assessment is only considered necessary for areas in which existing filling and soils will remain on the site.

The quantitative site assessment criteria adopted are shown in Table F2 in Appendix F. They have not been duplicated within the body of this report.

8. Data Quality Objectives

The investigation procedures and data quality objectives have been devised in general accordance with the seven-step data quality objective (DQO) process outlined in Australian Standard AS 4482.1 – 2005 *Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*. The various DQOs and QA/QC procedures adopted for the assessment are outlined in the SAQP which is included in Appendix D. They have not been duplicated within the body of this report.

9. Field Work Procedures

9.1 Soils Assessment

The field work for the DSI included the drilling of nine boreholes (BH1 to BH7, BH1A and BH2A) at the locations shown on Drawing C1 in Appendix B. This drilling density is considered sufficient for categorising the site on the basis of the minimum requirements outlined in *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995).

Bores BH1 and BH2 were drilled to depths of 8.3 m and 7.8 m using a truck-mounted DT100 drilling rig for both geotechnical investigation purposes and to install temporary groundwater monitoring wells. They were commenced using solid flight augers then continued using rotary wash-boring equipment inside top casing. Standard penetration tests were undertaken within the overburden at regular depth intervals. Soon after rock was encountered, the bores were advanced using NMLC-sized diamond core drilling equipment to obtain 50 mm diameter continuous samples of the rock for identification and strength testing purposes.

Bores BH3 to BH7, BH1A and BH2A were augered using a 3.5 t hydraulic excavator for contamination investigation purposes only.

Sampling was undertaken from the augers which was considered an appropriate technique due to the strength of the soils encountered on the site and the limited access for machinery. The mixing of soils from different depth horizons was minimised during sampling by careful drilling and supervision.

Soil sampling for contamination assessment purposes was performed in general accordance with the standard sampling procedures outlined in the *Douglas Partners Field Procedures Manual*. All sampling data were recorded on chain-of-custody information sheets. The sampling generally included:

- Soil sampling using decontaminated and/or disposable equipment;
- Placement of samples into laboratory prepared jars and immediate capping;
- Labelling of sample containers with individual and unique markings including project number, sample location, sample depth and date of sampling; and
- Storage of sample containers in a cooled, insulated container for transport to the laboratory.

The ground surface levels at the bores were measured to AHD using an automatic level.

9.2 Groundwater Assessment

The field work for the groundwater assessment included the installation of two temporary groundwater monitoring wells (BH1 and BH2). This involved placing Class 18 uPVC screen and solid casing in each borehole. A gravel pack was placed around the screen and a bentonite plug was placed above the gravel. The remainder of the void was backfilled with drill cuttings and the top of the wells were finished with a steel cover mounted flush with the surface.

Groundwater sampling was attempted some 3 weeks after the installation of the wells although the wells were dry and therefore samples could not be collected.

10. Results of Assessment

10.1 Field Work Results

The subsurface conditions encountered in the boreholes are presented in the borehole logs in Appendix E. Notes defining descriptive terms and classification methods are included in Appendix A.

The subsurface conditions encountered on the site can be described as:

- FILLING – asphalt, brick pavers, sandy, gravelly and clayey filling with varying proportions of gravel, fibre-cement sheeting, bricks, PVC fragments and rootlets to depths of 0.3 m to 0.5 m;
- RESIDUAL SOIL – clay to the base of the shallower bores and to depths of between 2.5 m and 2.6 m in the deeper bores; and
- BEDROCK – shale to the base of the deeper bores at depths of 7.8 m and 8.3 m.

Free groundwater was not observed during augering and the use of drilling fluid in the deeper boreholes prevented groundwater observations during rotary wash-boring and coring. The temporary groundwater monitoring wells were dry some 3 weeks after installation indicating that the groundwater table is below RL 100 m AHD.

10.2 Total Photoionisable Compounds Results

Replicate soil samples collected from the boreholes were stored under ambient conditions in re-sealable bags before screening for Total Photoionisable Compounds (TOPIC) using a calibrated Photoionisation Detector (PID). The results of the screening are shown on the borehole logs in Appendix E. The PID readings were all very low.

10.3 Analytical Results for Soil and Groundwater Samples

Envirolab Services Pty Ltd was commissioned to undertake the analysis of the majority of the soil samples. A tabulated summary of the results of the soil analysis is provided in Appendix F.

The summary includes Table F1 (Contaminant Concentrations in Soils) and Table F2 (Adopted Comparative Criteria for Soils).

The detailed analytical results, sample receipts and chain of custody documentation are included in Appendix G.

10.4 Field and Laboratory Quality Control Procedures

The field and laboratory QA/QC procedures adopted for the current assessment are described in Appendix H.

11. Discussion of Results

11.1 Soil Contamination

Seven soil samples (excluding QA/QC samples) were selectively analysed from the seven shallow boreholes drilled on the site. Six of these samples were obtained from the filling profile and one from the natural soils. This testing frequency is considered sufficient for characterising the site. The rationale for selecting the test locations is provided in Section 8 of this report.

All of the soil samples were within the adopted health-based investigation/screening levels for residential sites with minimal access to soils.

Three filling samples (BH1A/0.4-0.5 m, BH3/0.1-0.2 m and BH4/0.15-0.3 m) exhibited concentrations of Benzo(a)pyrene and/or Zinc which exceeded the ecological-based criteria. The ecological-based criteria are only considered relevant for areas of the site in which the existing filling and soil is to remain; this areas has yet to be confirmed.

Asbestos was detected in two of the filling samples (BH1A/0.4-0.5 m and BH6/0.3-0.45 m) which is probably present due to previous demolition activities on the site. Asbestos could also be present elsewhere on the site between the sampling locations.

11.2 Groundwater Contamination

Groundwater sampling was attempted from the wells installed on the site during the current investigation. However, the wells were dry at the time that sampling was attempted and samples could obviously not be collected. The groundwater table appears to be below RL 100 m AHD which is likely to be below the lowest proposed basement level.

12. Conclusions and Recommendations

12.1 Soils

The available site history information indicates that the site may have originally been used for residential purposes prior to redevelopment into commercial premises in the 1970s. The site immediately to the north is a Shell service station, a railway corridor is located immediately to the east, and roads are located to the south and west. Buildings constructed in the early-20th century have also been demolished on the site which indicates the possibility of hazardous building materials being present.

The six samples of filling and one sample of natural soil exhibited contaminant concentrations within the adopted health-based investigation/screening levels for residential sites with minimal access to soils. Volatile hydrocarbons were not detected in the soil samples obtained from the northern portion of the site which suggests that near-surface hydrocarbon leakage may not be occurring on the adjacent site.

Three filling samples (BH1A/0.4-0.5 m, BH3/0.1-0.2 m and BH4/0.15-0.3 m) exhibited concentrations of Benzo(a)pyrene and/or Zinc which exceeded the ecological-based criteria. The ecological-based criteria are only considered relevant for areas of the site in which the existing filling and soil is to remain; this has yet to be confirmed. The filling in these areas should therefore be removed from the site as part of the development works and, if planting is proposed in these areas, material imported to site to support the vegetation.

Asbestos was detected in two of the filling samples (BH1A/0.4-0.5 m and BH6/0.3-0.45 m) which is probably present due to previous demolition activities on the site. The filling in the basement zone will be removed as part of the works which will remove the source of the asbestos. Any filling that remains on site should be verified as being asbestos-free during the construction works.

On the basis of the DSI outlined in this report, and upon removal of the filling materials in areas where asbestos is present and where exceedances of the ecological-based criteria were encountered, the site is considered suitable for the proposed residential development from a soil contamination perspective. Validation of these works will need to be undertaken during construction.

12.2 Groundwater

Groundwater sampling was attempted from the wells installed on the site during the current investigation. However, the wells were dry at the time that sampling was attempted and samples could obviously not be collected. The groundwater table appears to be below RL 100 m AHD which is likely to be below the lowest proposed basement level.

However, seepage into the basement along the northern side of the site is of concern due to the presence of a service station immediately to the north. Leaking underground storage tanks (USTs) are commonly encountered on service station sites and any seepage of hydrocarbons from the adjacent site would need to be handled by intercepting the seepage on the adjacent site before it enters the basement. This should be the responsibility of the adjacent landowner.

Provided that seepage from the service station is controlled prior to entering the development site, the quality of the groundwater below the basement excavation should not hinder the development potential of the site. Additional assessment of seepage along the northern boundary should be undertaken post-DA approval to ensure appropriate provisions can be made in the design of the basement from a groundwater and vapour intrusion perspective.

13. Future Works

A summary of the recommendations in relation to soil and groundwater contamination are as follows:

- Validate any existing filling that is to remain on the site (i.e. outside the basement) as being suitable from an ecological perspective and as being free of asbestos materials;
- Test any seepage entering the excavation for hydrocarbons. If present, the seepage would need to be intercepted by the adjacent landowner prior to it leaving the service station site;
- Only import material to the site that has been validated as being suitable for residential sites.

14. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for a project at 871 – 877 Pacific Highway, Chatswood in accordance with DP's proposal SYD150137 dated 9 February 2015, and acceptance received from Mr Tomy Chan of PBD Architects on behalf of Megland Group Pty Ltd dated 13 February 2015. The report is provided for the use of Megland Group Pty Ltd 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.

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. Subsurface 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.

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.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

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

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.

Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

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Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approx Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Appendix B

Drawing

Groundwater well

Borehole

Douglas Partners Geotechnics / Environment / Groundwater	**Locations of Boreholes** **871-877 Pacific Highway** **CHATSWOOD**	PROJECT: 84722 DWG No: C1 REV: 0
	CLIENT: Megland Group Pty Ltd	DATE: 7-Apr-15

Appendix C

Historical Information

Photo 1 - 1930 image

Photo 2 - 1956 image

Douglas Partners Geotechnics / Environment / Groundwater	**Historical Aerial Photographs** **871-877 Pacific Highway** **Chatswood**	PROJECT: 84722 PLATE No: 1 REV: 0
	CLIENT: Megland Group Pty Ltd	DATE: 17-Mar-15

Photo 3 - 1961 image

Photo 4 - 1970 image

Douglas Partners Geotechnics / Environment / Groundwater	**Historical Aerial Photographs** **871-877 Pacific Highway** **Chatswood**	PROJECT: 84722 PLATE No: 2 REV: 0
	CLIENT: Megland Group Pty Ltd	DATE: 17-Mar-15

Photo 5 - 1986 image

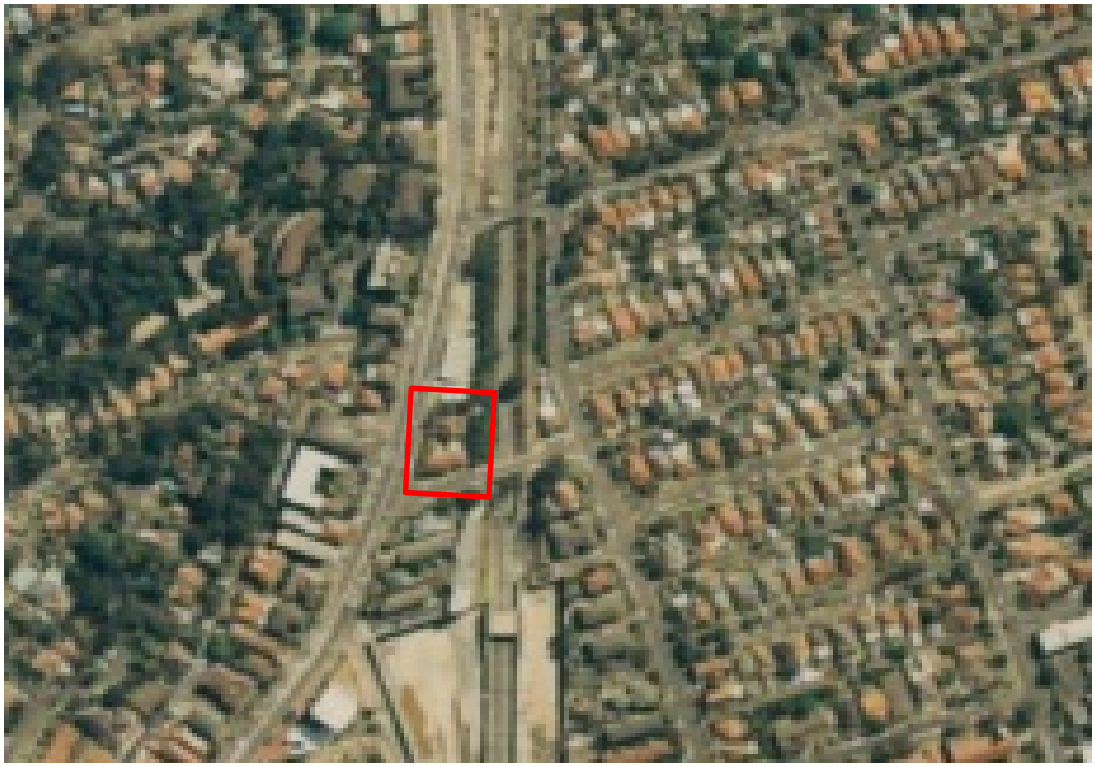


Photo 6 - 1991 image

Douglas Partners Geotechnics / Environment / Groundwater	**Historical Aerial Photographs** **871-877 Pacific Highway** **Chatswood**	PROJECT: 84722 PLATE No: 3 REV: 0
	CLIENT: Megland Group Pty Ltd	DATE: 17-Mar-15

Photo 7 - 2002 image

Photo 8 - 2014 image

Douglas Partners Geotechnics / Environment / Groundwater	**Historical Aerial Photographs** **871-877 Pacific Highway** **Chatswood**	PROJECT: 84722 PLATE No: 4 REV: 0
	CLIENT: Megland Group Pty Ltd	DATE: 17-Mar-15

Legal Liaison Searching Services

ABN: 52832569710
Ph: 02 9233 5800
Fax: 02 9221 2827

Level 4, 70 Castlereagh Street,
Sydney 2000
PO Box 2513 Sydney NSW 2000
DX 1019 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 871 to 877 Pacific Highway, Chatswood

Description: - Strata Plan 17870

As regards the part highlighted yellow and numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
28.09.1914 (1914 to 1919)	Frank John Finlay (Builder)	Vol 2518 Fol 120
01.04.1919 (1919 to 1920)	Ada Ruth Brennan (Married Woman)	Vol 2518 Fol 120
03.05.1920 (1920 to 1956)	William Henry Paradice (Sub Accountant)	Vol 2518 Fol 120
18.05.1956 (1956 to 1956)	Franklin Arthur Henry Paradice (Company Representative) Clive Bowman Wilkinson (Solicitor) (Section 94 Application not investigated)	Vol 2518 Fol 120
20.06.1956 (1956 to 1973)	Dorothy Lily Wilkinson (Married Woman)	Vol 2518 Fol 120 Now Vol 7758 Fol 82
27.06.1973 (1973 to 1978)	Jones Developments Pty Limited	Vol 7758 Fol 82
22.09.1978 (1978 to 1981)	Hobila Pty Limited	Vol 7758 Fol 82
19.10.1981 (1981 to 1982)	Morasi Pty Limited	Vol 7758 Fol 82 Now Vol 14600 Fol 120
08.02.1982	Registration of Strata Plan 17870	

Easements: - NIL

Leases: -

- 21.07.1978 to Billy Hyde Industries Pty Ltd, of part – expired 29.01.1981
- 29.01.1981 to Tyme & Justice Real Estate Pty Ltd, of Lock Up Showroom 3 – expires 30.11.1983, also option to renew
- 19.10.1981 to North Sydney Brick and Tile Company Limited, of Showroom 4 – expires 31.07.1984, also option to renew
- 19.10.1984 to Geoffrey Carruthers Bird, of Ground Floor, also option to renew
- 19.10.1981 to Monier Limited , of Showroom 2 – expires 30.11.1981, also option to renew

Legal Liaison Searching Services

ABN: 52832569710
Ph: 02 9233 5800
Fax: 02 9221 2827

Level 4, 70 Castlereagh Street,
Sydney 2000
PO Box 2513 Sydney NSW 2000
DX 1019 Sydney

As regards the part highlighted yellow and numbered (2) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
29.11.1920 (1920 to 1938)	Walter Taylor (Station Manager)	Vol 1227 Fol 63
25.02.1938 (1938 to 1939)	Walter Jackson (Builder)	Vol 1227 Fol 63
10.01.1939 (1939 to 1939)	Arthur Ernest Curtis (Retired)	Vol 1227 Fol 63 Now Vol 5025 Fol 142
09.08.1939 (1939 to 1949)	John Stanley Christian (Retired Grazier)	Vol 5025 Fol 142
05.09.1949 (1949 to 1950)	Bowral Properties Pty Limited	Vol 5025 Fol 142
04.05.1950 (1950 to 1952)	Southern Highlands Home Builders Pty Limited	Vol 5025 Fol 142
16.12.1952 (1952 to 1958)	William Howse King (Freeholder) Kathleen Jane Eames King (Married Woman)	Vol 5025 Fol 142
10.10.1958 (1958 to 1973)	John Seeto (Store Keeper) Lillian Seeto (Married Woman)	Vol 5025 Fol 142 Now Vol 7635 Fol's 82 & 83
24.05.1973 (1973 to 1978)	Jones Developments Pty Limited	Vol 7635 Fol's 82 & 83 Now Vol 12177 Fol 154
22.09.1978 (1978 to 1981)	Hobila Pty Limited	Vol 12177 Fol 154
19.10.1981 (1981 to 1982)	Morasi Pty Limited	Vol 12177 Fol 154
08.02.1982	Registration of Strata Plan 17870	

Easements: - NIL

Leases: -

- 19.10.1981 to Bruce Arnold Christie, of lock up Showroom 1, expires 31.01.1984, also option to renew
  - 19.10.1981 transferred to Denis Gregory Lynch
- 19.10.1981 to John Joseph Smith, Victor Trevor Krantz and Keith Batty, of Suite 2 Ground Floor, expires 31.01.1982, also option to renew
- 19.10.1981 to Monier Limited, of Showroom 2, expires 30.11.1981, also option to renew

Search continued as regards the Common Property areas – Strata Plan 17870

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.02.1982 (1982 to date)	# The Owners – Strata Plan 17870	Vol 12177 Fol 154 & Vol 14600 Fol 120 Now CP/SP 17870

# Denotes current registered proprietors

Leases & Easements continued - NIL

Yours Sincerely
Mark Groll
25 March 2015
(Ph: 0412 199 304)

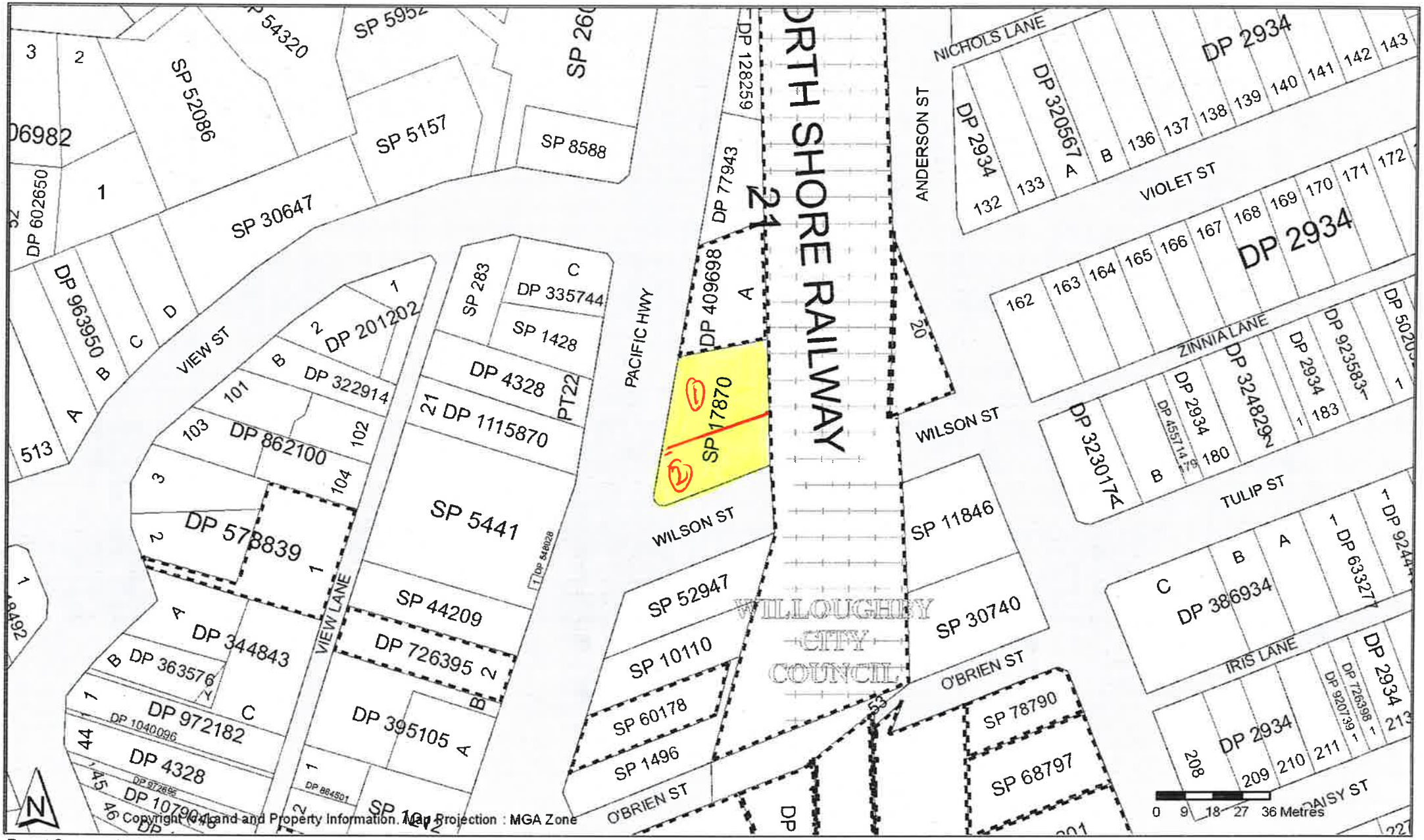
Land & Property Information

Cadastral Records Enquiry Report

Ref : 29

Requested Parcel : SP 17870 **Identified Parcel** : SP 17870

Locality : CHATSWOOD **LGA** : WILLOUGHBY **Parish** : WILLOUGHBY **County** : CUMBERLAND



 Map Projection : MGA Zone

Report Generated 11:09:24 AM, 25 March, 2015

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

FORM 1

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

*OFFICE USE ONLY

COUNCIL'S CERTIFICATE

The Council of the *City, *Municipality, *Shire of WILLOUGHBY having satisfied itself that the requirements of the Strata Titles Act, 1973 (other than the requirements for the registration of plans) have been complied with, approves of the proposed

* strata plan
* strata plan of subdivision

illustrated herein.

*Council does not object to the encroachment of the building beyond the alignment of

*This approval is given on the condition that [illegible]

also subject to the restriction as user referred to in section 39 of the Strata Titles Act, 1973.

Date 17-9-1981

Subdivision No. 5261/81

Council Clerk.

*Complete, or delete if inapplicable.

SURVEYOR'S CERTIFICATE

I, PETER W LEANE OF MICHAEL C. WHELAN of 65 YORK ST, SYDNEY, 2000. DX288 a surveyor registered under the Surveyors Act, 1929, hereby certify that—

(1) any wall, the inner surface or any part of which corresponds substantially with any line shown on the accompanying floor plan as a boundary of a proposed lot, exists;

(2) any floor or ceiling, the upper or under surface or any part of which forms a boundary of a proposed lot, shown in the accompanying floor plan, exists;

(3) any wall, floor, ceiling or structural cubic space, by reference to which any boundary of a proposed lot shown in the accompanying floor plan is defined, exists;

(4) any building containing proposed lots erected on the land shown on the accompanying location plan and each proposed lot shown on the accompanying floor plan are wholly within the perimeter of the parcel * subject to subparagraphs (a) and (b),

*(a) except to the extent that the building encroaches on a public place;

*(b) eaves and guttering of the building encroach on land other than a public place, in respect of which eaves and guttering an appropriate easement has been created by registered [illegible]

* (5) the survey information recorded in the accompanying location plan is accurate.

Signature P.W. Leane

Date 19th MAY 1981

* Delete if inapplicable
† State whether dealing or plan, and quote registered number.

This is sheet 1 of my Plan in 5 sheets.

PLAN OF LOT B IN D.P. 409698 & PART OF LOT 1 D.P. 60298

(E)

Mun./~~Shire~~ ~~City~~ : WILLOUGHBY

Locality : CHATSWOOD

Parish : WILLOUGHBY

County : CUMBERLAND

Reduction Ratio 1: 300

Lengths are in metres

STRATA PLAN 17870

Registered : 8.2.1982

C.A. : Nº S261/81 OF 17-9-1981

Purpose : STRATA PLAN

Ref. Map : WILLOUGHBY 19*

Last Plan : D.P. 60298 D.P. 409698

Name of, and *address for service of notices on, the body corporate
*Address required on original strata plan only.

THE REGISTERED PROPRIETORS OF STRATA PLAN Nº 17870
Nº 871 - 877 PACIFIC HIGHWAY, CHATSWOOD, N.S.W. 2067

Signatures, seals and statements of intention to create easements or restrictions as to user.

THE Common Seal of MORASI Pty Limited WAS HEREUNTO AFFIXED by AUTHORITY OF THE BOARD IN THE PRESENCE OF

[illegible] DIRECTOR & SECRETARY

MORASI PTY. LIMITED Common Seal

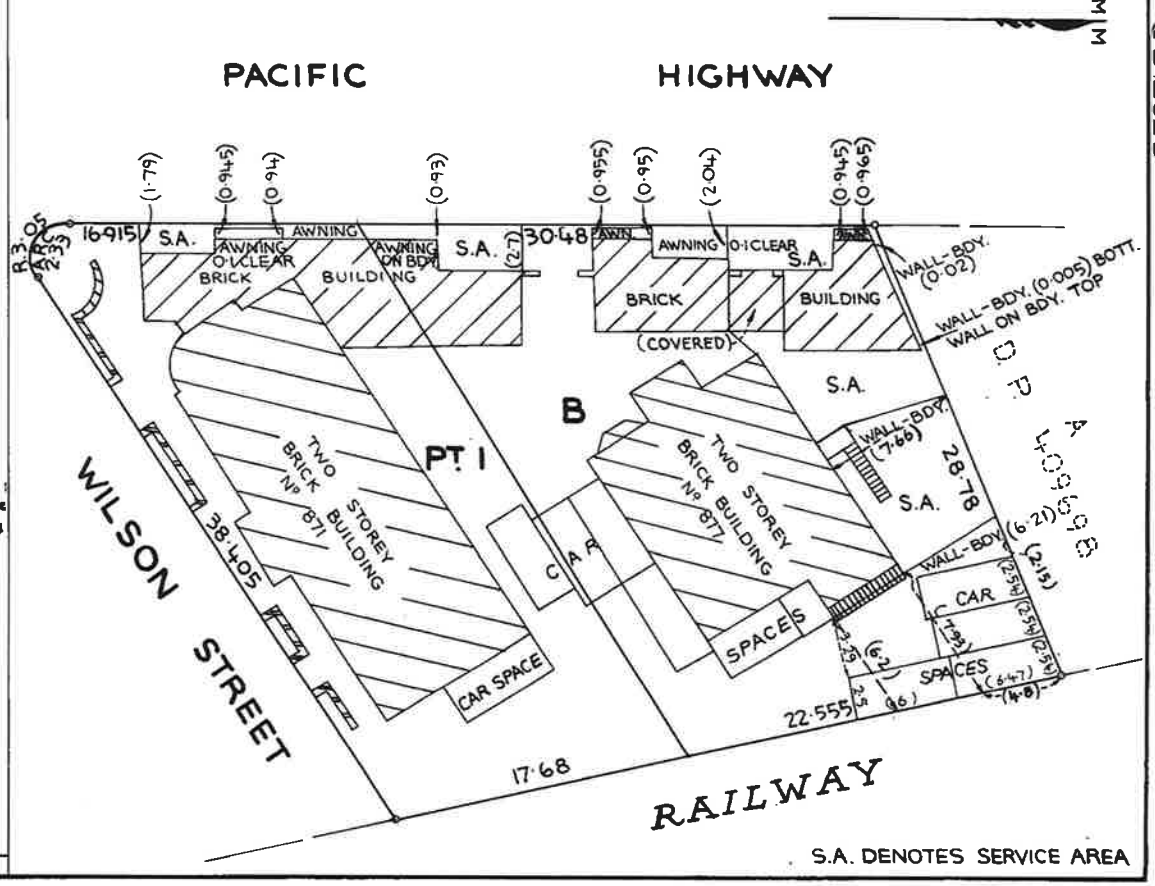
P.T. LIMITED
by its undersigned Attorney
Who declares the Power of Attorney under which this document is signed is dated 11th February, 1960, and that he has not received any Notice of Revocation of such Power of Attorney. Miscellaneous Register No. 62433, Land Titles Office No. 16746.

ROBERT McINTOSH ANDERSON
INVESTMENTS OFFICER

SIGNED FOR AND ON BEHALF OF P.T. LIMITED IN THE PRESENCE OF

ALLAN COWPER A Justice of the Peace in and for the State of New South Wales

ASST CORPORATE TRUST OFFICER



SURVEYOR'S REFERENCE: S.949

Plan Drawing only to appear in this space

Plan Drawing only to appear in this space

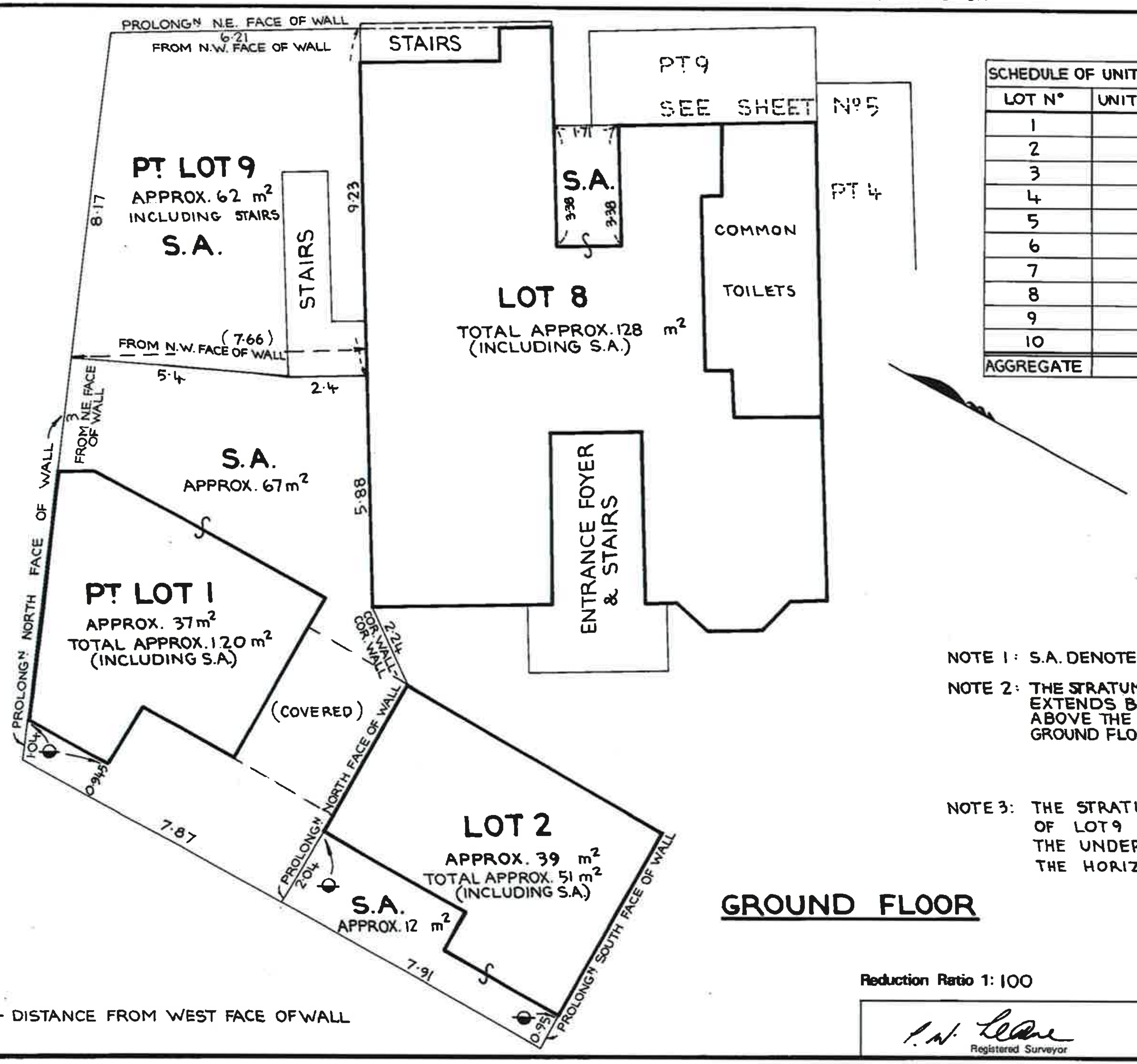
FORM 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

STRATA PLAN 17870

SCHEDULE OF UNIT ENTITLEMENT		OFFICE USE ONLY
LOT N°	UNIT ENTITLEMENT	RESUBDIVISION
1	90	
2	80	
3	110	
4	110	
5	90	
6	120	
7	60	
8	100	
9	130	
10	110	
AGGREGATE	1000	

·OFFICE USE ONLY



NOTE 1: S.A. DENOTES SERVICE AREA

NOTE 2: THE STRATUM OF THE SERVICE AREAS EXTENDS BETWEEN 1M. BELOW & 3M. ABOVE THE UPPER SURFACE OF THE GROUND FLOOR OF THEIR RESPECTIVE ADJOINING PART OF LOTS EXCEPT WHERE COVERED.

NOTE 3: THE STRATUM OF THE EXTERNAL STAIRS OF LOT 9 IS LIMITED IN HEIGHT TO THE UNDERSIDE OF THE GUTTERING AND THE HORIZONTAL PROJECTION THERE OF.

GROUND FLOOR

⊖ DISTANCE FROM WEST FACE OF WALL

Reduction Ratio 1: 100

Lengths are in metres

Registered Surveyor

Council Clerk

SURVEYOR'S REFERENCE: S. 949

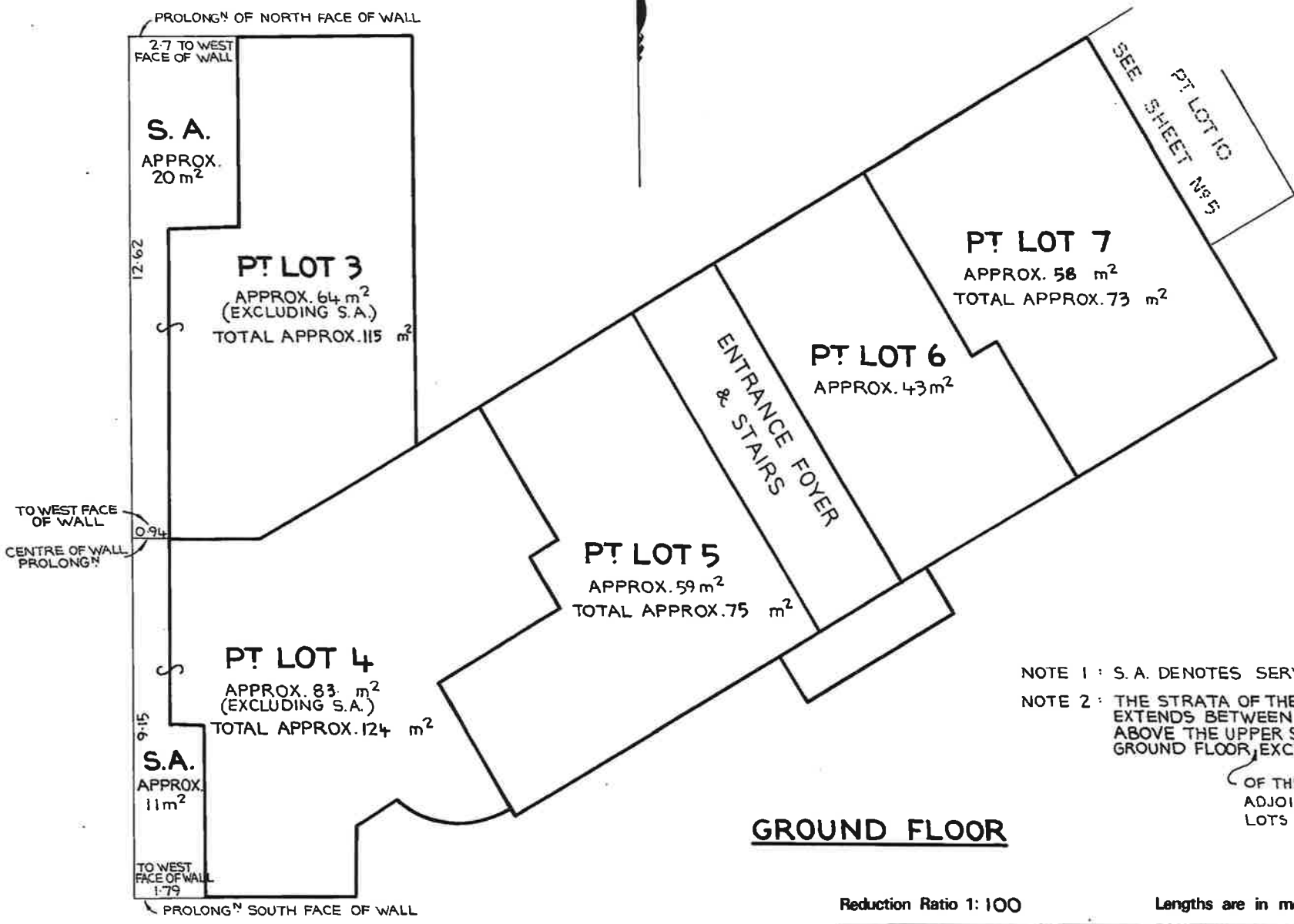
SP 17870 S/2

FORM 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

Sheet No. 3 of 5 Sheets

STRATA PLAN 17870



NOTE 1 : S. A. DENOTES SERVICE AREA

NOTE 2 : THE STRATA OF THE SERVICE AREAS EXTENDS BETWEEN 1M. BELOW & 3M. ABOVE THE UPPER SURFACE OF THE GROUND FLOOR, EXCEPT WHERE COVERED, OF THEIR RESPECTIVE ADJOINING PART OF LOTS

GROUND FLOOR

Reduction Ratio 1: 100

Lengths are in metres

P. W. Leane
Registered Surveyor

Woodwards
Council Clerk

SURVEYOR'S REFERENCE: S.949

OFFICE USE ONLY

26 JUL 1982

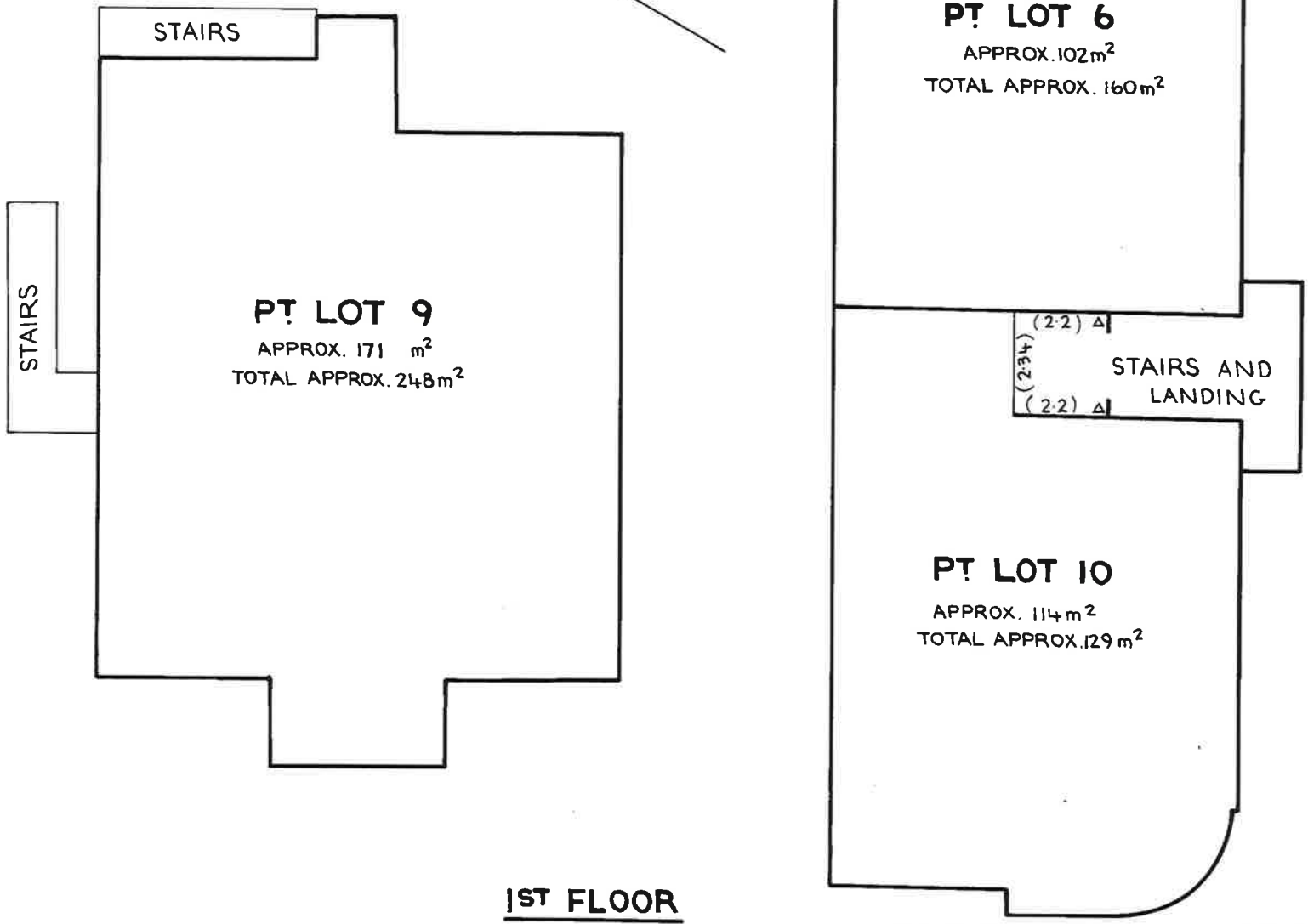
26 OCT 1982

FORM 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

Sheet No. 4 of 5 Sheets

STRATA PLAN 17870



1ST FLOOR

Δ FROM THE N.W. FACE OF WALL.

Reduction Ratio 1: 100

Lengths are in metres

P. N. Leane
Registered Surveyor

Council Clerk

SURVEYOR'S REFERENCE: S. 949

·OFFICE USE ONLY

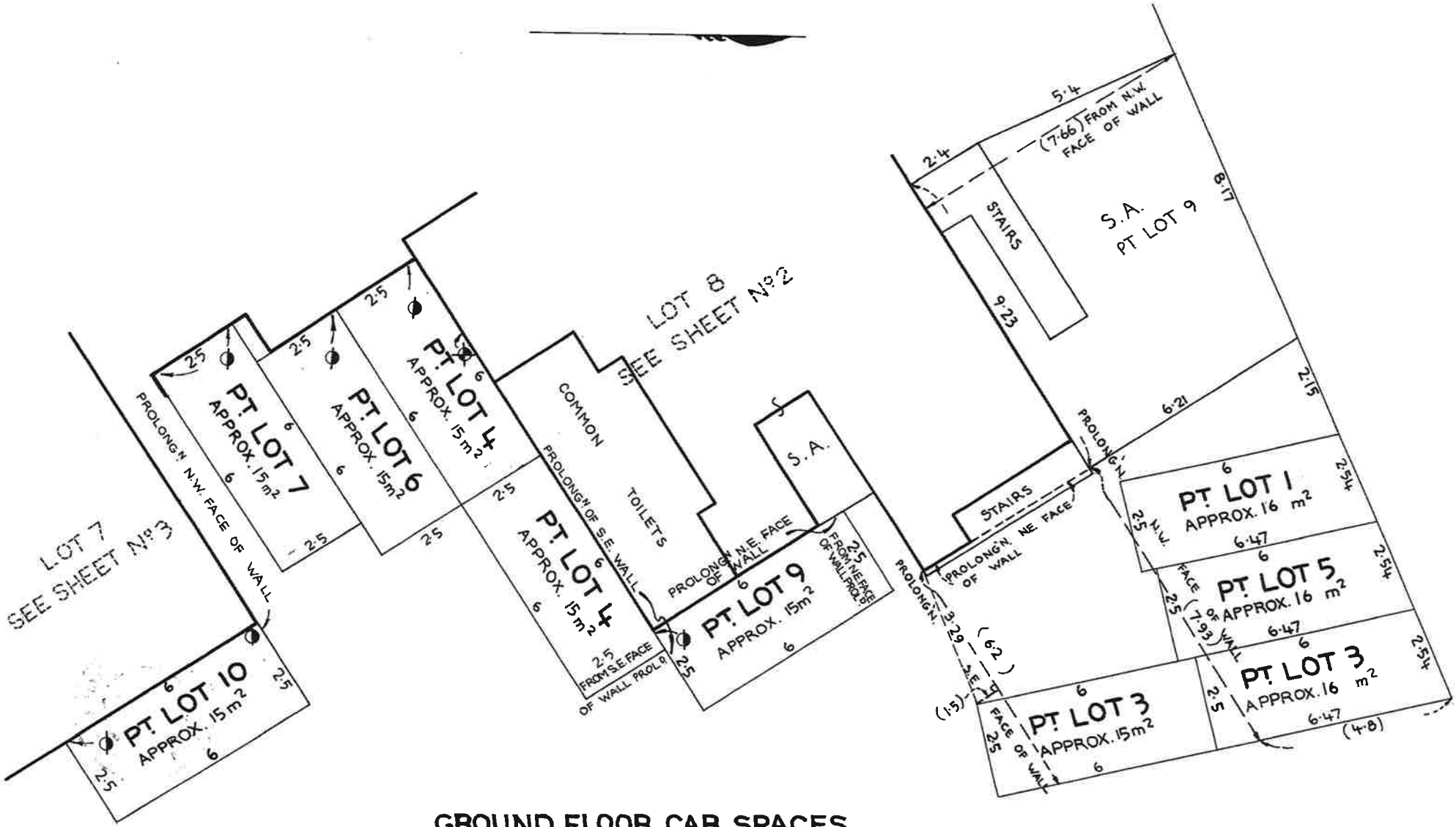
FORM 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

Sheet No. 5 of 5 Sheets

STRATA PLAN 17870

*OFFICE USE ONLY



GROUND FLOOR CAR SPACES

NOTE : THE STRATA OF THE CAR SPACES IS LIMITED TO 3M. ABOVE THEIR RESPECTIVE BITUMEN CAR SPACES. THE UPPER SURFACE OF

⊖ DISTANCE FROM N.E. FACE OF WALL

⊕ DISTANCE FROM S.E. FACE OF WALL

Reduction Ratio 1: 100

Lengths are in metres

P. N. Leane
Registered Surveyor

Council Clerk

SURVEYOR'S REFERENCE: S 949

[redacted]FICATE OF TITLE

NEW SOUTH WALES

[redacted]EAL PROPERTY ACT, 1900

14600120

Appln No 10234

Prior Title Vol. 7758 Fol. 82

Vol. 14600 Fol. 120

EDITION ISSUED

12 / 1982

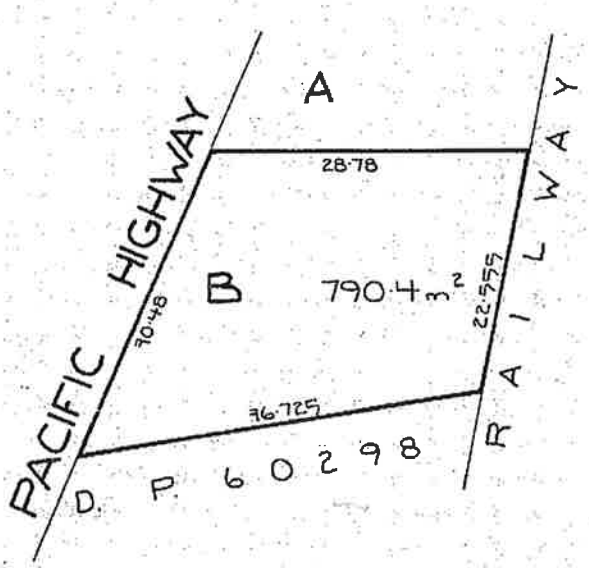
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



S705468

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot B in Deposited Plan 409698 in the Municipality of Willoughby Parish of Willoughby County of Cumberland being part of Portion 294 granted to Isaac Nichols on 18-12-1805.

FIRST SCHEDULE

MORASI PTY. LIMITED

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. S123482 Lease to Tyme and Justice Real Estate Pty. Limited of premises known as Lock-Up Showroom No. 3,877 Pacific Highway, Chatswood. together with rights and option of renewal. Expires 30-11-1983.
3. S705477 Lease to North Sydney Brick and Tile Company Limited of premises known as Lock-Up Showroom No. 4,877 Pacific Highway, Chatswood together with and reserving rights with option of renewal Expires 31-7-1984.
4. S705481 Lease to Geoffrey Carruthers Bird of premises known as Ground Floor, 877 Pacific Highway, Chatswood (excluding entrance vestibule) together with option of renewal. Expires 31-5-1984.
5. S705483 Lease to Monier Limited of premises known as Showroom No. 2,871-877 Pacific Highway, Chatswood together with option of renewal. Expires 30-11-1981.
6. S705486 Mortgage to P.T. Limited.

264

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

This deed is cancelled as to Whole

New Certificates of Title have issued on 22-NOV-1982

for lots In Strata Plan No. 17870 as follows:-

Lots 1 & 10 Vol. 14881 Fol. 147 | 156 respectively.

Common Property Vol. 14881 Fol. 196

REGISTRAR GENERAL

NEW CERTIFICATE(S) OF TITLE ISSUING ON SP 17870
NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO DEALINGS BRANCH.

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
S705486 MORTGAGE S821519 VARIATION REGISTERED 14-1-1982		

NOTATIONS AND UNREGISTERED DEALINGS

SP17870 S821519 J.M.R

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CA

Req:R250540 /Doc:CT 14600-120 CT /Rev:23-Dec-2010 /Sts:OK.SC /Prt:25-Mar-2015 08:48 /Pgs:ALL /Seq:2 of 2 /Src: /Ref:SH

CERTIFICATE OF TITLE

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

TORRENS TITLE
Register

Vol. 12177 Fol. 154

Appln. No.10298

Prior Titles Vol.7635 Fols.82 and 83

Edition issued 27-7-1973

N279832

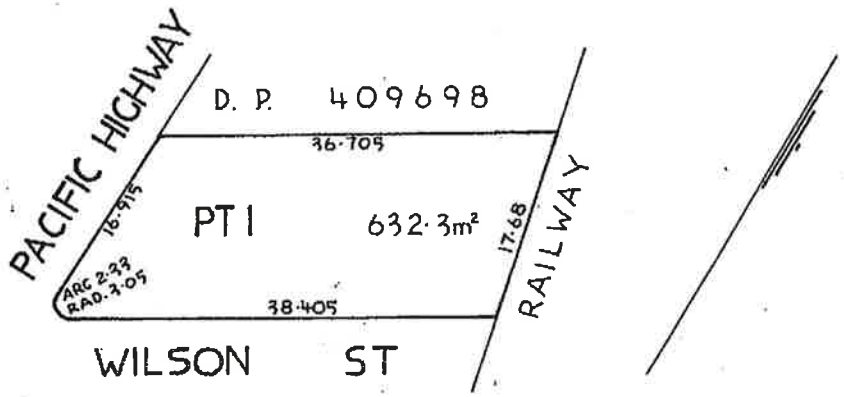
(Page 1) Vol. 12177 Fol. 154

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



N279832 KR.

REDUCTION RATIO 1:500

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in the part of Lot 1 in Deposited Plan 60298 shown in the plan hereon in the Municipality of Willoughby Parish of Willoughby and County of Cumberland being part of Portion 294 granted to Isaac Nichols on 18-12-1805.

FIRST SCHEDULE

~~JONES DEVELOPMENTS PTY. LIMITED~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Registrar General

Vol. 12177 Fol. 154

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
~~Mobile Pty Limited~~	Transfer	Q786807		22-9-1978	
Morasi Pty. Limited by Transfer S705485. Registered 19-10-1981					
CANCELLED 8.12.81					
See new ~~edition~~					
Vide S705486					
REGISTRAR GENERAL					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Mortgage~~	N279833	~~24-6-1973~~ 24-5-73	~~to FNCB Waltons Finance Limited~~	~~21-8-1973~~ 21-8-73		Discharged	Q786800	
Mortgage	P311470	17-9-1974	to FNCB Waltons Finance Limited	14-10-1974		Discharged	Q786799	
Mortgage	R880286		to The National Bank of Australasia Limited	23-6-1980		Discharged	S47086	
Mortgage	S47086		to N.C.N.A. Finance Ltd	28-1-1981		Discharged	S705473	
S555473 Caveat by Denis Gregory Lynch, Registered 6-7-1981 as regards premises known as lock-up showroom No.1/871 Pacific Highway, Chatswood. Registered 6-7-1981.						Withdrawn	S705472	
S705474 Lease to Bruce Arnold Christie of premises known as lock up showroom No 1, 871 Pacific Highway, Chatswood. Together with and reserving rights with option of renewal. Expires 31-1-1984. Registered 19-10-1981.								
S705476 Lease: Lessee - Denis Gregory Lynch by Transfer S705476. Registered 19-10-1981								
S705479 Lease to John Joseph Smith, Victor Trevor Krantz and Keith Batty of premises known as Suite 2, Ground Floor, 871 Pacific Highway Chatswood together with and reserving rights with option of renewal. Expires 31-1-1982. Registered 19-10-1981								
S705483 Lease to Monier Limited of premises known as Showroom No. 2 871-877 Pacific Highway, Chatswood, together with and reserving rights with option of renewal. Expires 30-11-1981. Registered 19-10-1981								
S705486 Mortgage to P.T. Limited. Registered 19-10-1981								

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

N279833 R
P311470M
Q786799D
-8000M
-80FT
R880286M R
S47086M
-87M
S555473 C
S705472 W
S705473 D
S705474
S705476
S705479
S705483
S705486
(MF)

[redacted]ICATE OF TITLE

NEW SOUTH WALES

[redacted]L PROPERTY ACT, 1900

12177154

Vol. 12177 Fol. 154

Appln No 10298

Prior Titles Vol. 7635 Fols. 82 and 83

EDITION ISSUED

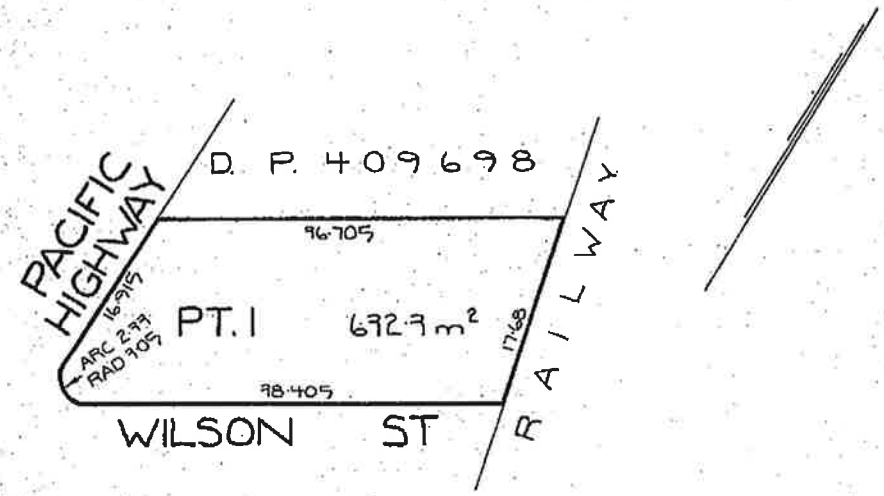
12 1 1982

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



S705486 [redacted]

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in the part of Lot 1 in Deposited Plan 60298 shown in the plan hereon in the Municipality of Willoughby Parish of Willoughby County of Cumberland being part of Portion 294 granted to Isaac Nichols on 18-12-1805.

FIRST SCHEDULE

MORASI PTY. LIMITED

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. S705474 Lease to premises known as Lock-up Showroom No, 1, 871 Pacific Highway, Chatswood together with and reserving rights with option of renewal. Lessee now Denis Gregory Lynch by Transfer S705476. Expires 31-1-1984.
3. S705479 Lease to John Joseph Smith, Victor Trevor Krantz and Keith Batty of premises known as Suite 2, Ground Floor, 871 Pacific Highway, Chatswood together with and reserving rights with option of renewal. Expires 31-1-1982.
4. S705483 Lease to Monier Limited of premises known as Showroom No. 2, 871-877 Pacific Highway Chatswood, together with and reserving rights with option of renewal. Expires 30-11-1981.
5. S705486 Mortgage to P. T. Limited.

Vol. 12177 Fol. 154

94137C 4.81 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

Registrar General

This deed is cancelled as to Whole

New Certificates of Title have issued on 22-11-1982

for lots in Stratton Plan No. 17870 as follows:-

Lots 1 to 10 Vol. 14044 Fol. 147 to 156 respectively.

Common Property Vol. 14041 Fol. 146

REGISTRAR GENERAL

NEW CERTIFICATE(S) OF TITLE ISSUING ON SP17870
NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO DEALINGS BRANCH.

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
S705486 MORTGAGE S821519 VARIATION REGISTERED 14-1-1982		

NOTATIONS AND UNREGISTERED DEALINGS

SP17870
S821519 VM K

CERTIFICATE OF TITLE

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

CANCELLED

Vol. 14941 Fol. 146

First Title Old System OS

Prior Titles Vol. 12177 Fol. 154
Vol.14600 Fol. 120

EDITION ISSUED SEE AUTO FOLIO

22 11 1982

I certify that The Proprietors - Strata Plan No. 17870 is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the common property in the strata scheme relating to the Strata Plan so numbered, within the land described, subject to the recordings hereon and to the provisions of the Real Property Act, 1900.

S

Registrar General.

14941 146 Fol.
(Page 1) Vol.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

ADDRESS FOR SERVICE OF NOTICES 871-877 PACIFIC HIGHWAY, CHATSWOOD 2067.

LAND REFERRED TO Lot 8 in Deposited Plan 409698 and part of Lot 1 in Deposited Paln 60298 at Chatswood in the Municipality of Willoughby Parish of Willoughby County of Cumberland.

GRY RECORDINGS NIL

SCHEDULE OF UNIT ENTITLEMENT

Aggregate unit entitlement: 1000

Lot No.	Strata Plan No.	Unit Entitlement
1	17870	90
2	"	80
3	"	110
4	"	110
5	"	90
6	"	120
7	"	60
8	"	100
9	"	130
10	"	110

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

14941146

Req:R250503 /Doc:CT 14941-146 CT /Rev:01-Mar-2011 /Sts:OK.SC /Prt:25-Mar-2015 08:44 /Pgs:ALL /Seq:1 of 2
Ref:SH /Src:T

Vol. 14941 Fol. 146

RECORDINGS (continued)

PARTICULARS	Registrar General	CANCELLATION

NOTATIONS AND UNREGISTERED DEALINGS

AFFIX REGN
RQTE ALL
DLGS & PLANS
TO SURV

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: CP/SP17870

SEARCH DATE	TIME	EDITION NO	DATE
25/3/2015	8:40 AM	1	16/2/1996

LAND

THE COMMON PROPERTY IN THE STRATA SCHEME BASED ON STRATA PLAN 17870 WITHIN THE PARCEL SHOWN IN THE TITLE DIAGRAM

AT CHATSWOOD
LOCAL GOVERNMENT AREA WILLOUGHBY
PARISH OF WILLOUGHBY COUNTY OF CUMBERLAND
TITLE DIAGRAM SHEET 1 SP17870

FIRST SCHEDULE

THE OWNERS - STRATA PLAN NO. 17870
ADDRESS FOR SERVICE OF NOTICES:
871-877 PACIFIC HIGHWAY
CHATSWOOD 2067

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
* 2 ATTENTION IS DIRECTED TO BY-LAWS SET OUT IN SCHEDULE 1 STRATA SCHEMES MANAGEMENT ACT 1996
3 O921261 CHANGE OF BY-LAWS

SCHEDULE OF UNIT ENTITLEMENT (AGGREGATE: 1000)

STRATA PLAN 17870

LOT	ENT	LOT	ENT	LOT	ENT	LOT	ENT
1	90	2	80	3	110	4	110
5	90	6	120	7	60	8	100
9	130	10	110				

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

SH PRINTED ON 25/3/2015

ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

PLANNING CERTIFICATE ISSUED UNDER SECTION 149(2)
ENVIRONMENT PLANNING AND ASSESSMENT ACT, 1979

Certificate No:	33119
Receipt No:	1494360
Issue date:	26-Mar-2015
Customer Ref:	84722:14384

P Oitmaa
96 Hermitage Rd
WEST RYDE NSW 2114

Property Location:	1/871 Pacific Highway, CHATSWOOD NSW 2067.
Legal Description:	**LOT 1 SP 17870**

Disclaimer

1. *The information provided in this certificate has been obtained from Council's records. The Council advises that:*

   (a) *other authorities may hold information in respect of the property not contained in the Council's records; and*
   (b) *the Council's records themselves may not be complete or accurate in respect of the property.*

2. *The instrument(s) referred to in this certificate may contain other important information in respect to the property. In order to understand the effects of the instrument(s) on the property, the Council advises that the whole of each instrument(s) should be read and considered. This certificate cannot be used as a substitute for reading the whole of the instrument(s) referred to in the certificate.*

3. *It may be appropriate or necessary to obtain legal or other expert advice in respect of the matters contained in the certificate or the instruments referred to in the certificate.*

4. *The Council cannot and will not accept any liability in respect of any error, inaccuracy, or omission in this certificate.*

Debra Just
GENERAL MANAGER

(Computer printed copy – No signature required)

PLANNING CERTIFICATE ISSUED UNDER SECTION 149(2)
ENVIRONMENT PLANNING AND ASSESSMENT ACT, 1979

WILLOUGHBY
CITY COUNCIL

Certificate No:	33119
Receipt No:	1494360
Issue date:	26-Mar-2015
Customer Ref:	84722:14384

1. RELEVANT PLANNING INSTRUMENTS AND DEVELOPMENT CONTROL PLANS

(1) Environmental Planning Instruments

As at the date of this certificate the above mentioned land is affected by the following environmental planning instruments:

Willoughby Local Environmental Plan 2012

State Environmental Planning Policy No. 19 - Bushland in Urban Areas
State Environmental Planning Policy No. 21 - Caravan Parks
State Environmental Planning Policy No. 30 - Intensive Agriculture
State Environmental Planning Policy No. 32 - Urban Consolidation (Redevelopment of Urban Land)
State Environmental Planning Policy No. 33 - Hazardous and Offensive Development
State Environmental Planning Policy No. 50 - Canal Estate Development
State Environmental Planning Policy No. 55 - Remediation of Land
State Environmental Planning Policy No. 62 – Sustainable Aquaculture
State Environmental Planning Policy No. 64 - Advertising and Signage
State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development
State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)
State Environmental Planning Policy (Major Development) 2005
State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Affordable Rental Housing) 2009
State Environmental Planning Policy (State and Regional Development) 2011
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

(2) Proposed Environmental Planning Instruments

As at the date of this certificate the above mentioned land is affected by the following proposed environmental planning instruments:

Draft State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development (Amendment 3)

(3) Development Control Plans

As at the date of this certificate the above mentioned land is affected by the following development control plans:

Development Control Plan 2005 - Sydney Foreshore and Waterways Area

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The plan applies to all development proposals within the foreshores and waterways area identified in SREP (Sydney Harbour Catchment) 2005 - (Refer to the Foreshores and Waterways Area Map).

Willoughby Development Control Plan

2. ZONING AND LAND USE

(a) Zone Identity

B5 Business Development

(b), (c), (d) (Development)

Zone B5 Business Development – under Willoughby Local Environmental Plan 2012

Objectives of zone

- *To enable a mix of business and warehouse uses, and bulky goods premises that require a large floor area, in locations that are close to, and that support the viability of, centres.*
- *To accommodate businesses, provided that their access needs and the traffic generated does not interfere with the safety and efficiency of the road network.*

Permitted without consent

Nil

Permitted with consent

Building identification signs; Bulky goods premises; Business identification signs; Child care centres; Garden centres; Hardware and building supplies; Hotel or motel accommodation; Landscaping material supplies; Neighbourhood shops; Passenger transport facilities; Respite day care centres; Restaurants or cafes; Roads; Shop top housing; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4.

Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Marinas; Mooring pens; Mortuaries; Open cut mining; Port facilities; Recreation facilities (major); Registered clubs; Research stations; Residential accommodation; Resource recovery facilities; Restricted premises; Retail premises; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport

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depots; Truck depots; Vehicle body repair workshops; Veterinary hospitals; Waste disposal facilities; Water recycling facilities; Water supply systems; Wharf or boating facilities; Wholesale supplies.

NOTE: You are advised that in addition to the matters set out above, the instrument may make further provisions with respect to the purposes for which development may be carried out on the land without consent and with consent and the purposes for which development of the land is prohibited. Applicants are advised that they should read the whole of the instrument(s) in order to determine whether that instrument prohibits, restricts or otherwise relates to the development of the land.

(e) Development Standards applying to the land fixing minimum dimensions for the erection of a dwelling house?

No
(NB: the erection of a dwelling house on the land requires development consent to be obtained which will require assessment of the particular application under section 79C of the Act. The Council makes no representation that development consent will be granted to any application.)

(f) Critical Habitat

– –

(g) Conservation Area

– –

(h) Heritage Item

– –

3. COMPLYING DEVELOPMENT

NOTE: This certificate only addresses matters raised in Clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. It is your responsibility to ensure that the development is permissible with consent in the land use zone and that you comply with any other requirements of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 including Clauses 1.18 and 1.20 of that Policy, the Complying Development Codes in Parts 3 to 8 of that Policy, and the Willoughby Local Environmental Plan 2012. Failure to comply with these provisions may mean that a Complying Development Certificate issued under the provisions of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 is invalid.

(a) General Housing Code and Rural Housing Code

The land is land on which complying development may be carried out under these Codes.

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(b) Housing Alterations Code and General Development Code

The land is land on which complying development may be carried out under these Codes.

(c) Commercial and Industrial Alterations Code

The land is land on which complying development may be carried out under this Code.

(d) Commercial and Industrial (New Buildings and Additions) Code

The land is land on which complying development may be carried out under this Code.

(e) Subdivisions Code

The land is land on which complying development may be carried out under this Code.

(f) Demolition Code

The land is land on which complying development may be carried out under this Code.

(g) Fire Safety Code

The land is land on which complying development may be carried out under this Code.

4. COASTAL PROTECTION

The land is not affected by Section 38 or 39 of the Coastal Protection Act 1979, (as advised by the Department of Public Works).

4A CERTAIN INFORMATION RELATING TO BEACHES AND COASTS

(1) – –
(2) – –
(3) – –

4B ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORKS.

– –

WILLOUGHBY
CITY COUNCIL

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Receipt No:	1494360
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5. MINE SUBSIDENCE

The land is not within a proclaimed mine subsidence district under Section 15 of the Mine Subsidence Compensation Act, 1961.

6. ROAD WIDENING AND REALIGNMENT

The land is not affected by road widening or road realignment under:-

1) Division 2 of Part 3 of the Roads Act 1993; or
2) An Environmental Planning Instrument; or
3) A resolution of Council.

7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK

The land is not affected by a policy adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

It is the Council's policy to consider previous land uses to determine whether land may be affected by contamination which restricts or prohibits the carrying out of development on the land. Depending on the previous uses of the land, the applicant may be required to investigate possible site contamination and/or carry out remediation as part of any proposed development and the development potential of the site may be restricted or prohibited. This is assessed by the Council on a case-by-case basis.

The Council will have regard to Clause 6.1 Acid Sulfate Soils of Willoughby Local Environmental Plan 2012 and the Acid Sulfate Soils Map in assessing any development applications relating to the land.

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi-dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is not subject to flood related development controls

(2) Development on that land or part of the land for any other purpose is not subject to flood related development controls

NB. This response does not imply that development for particular purposes is permissible on the land. Development is permissible in accordance with the zoning and landuse as set out in Question 2. ZONING AND LANDUSE of this Certificate.

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Based on the information currently available from Council's flood maps, this land is not affected by overland flooding. However, Council reviews flood studies on an on-going basis and new information may become available in future which may alter the flood affectation status of the subject parcel of land.

It is important to note that in some circumstances, a piece of land may experience inundation as a result of the creation of stormwater detention basins, channels or flow paths after the development of the land. The applicant is therefore advised to engage the services of a suitably qualified engineer to investigate whether remedial measures should be adopted to minimise the effects of any such inundation.

8. LAND RESERVED FOR ACQUISITION

The land is not affected by any environmental planning instrument, deemed environmental planning instrument or draft environmental planning instruments which provides for the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9. CONTRIBUTION PLANS

Willoughby City Section 94A Development Contributions Plan 2011

9A. BIODIVERSITY CERTIFIED LAND

– –

10. BIOBANKING AGREEMENTS

– –

11. BUSH FIRE PRONE LAND

The land has not been identified as bush fire prone under the Rural Fires and Environmental Legislation Amendment Act 2002.

12. PROPERTY VEGETATION PLANS

– –

13. ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

– –

14. DIRECTIONS UNDER PART 3A

– –

WILLOUGHBY
CITY COUNCIL

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15. SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

– –

16. SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

– –

17. SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

– –

18. PAPER SUBDIVISION INFORMATION

– –

19. SITE VERIFICATION CERTIFICATES

– –

In addition to the information provided above, the following information is provided in respect of the abovementioned land.

– –

NOTES:

Hand written or typed items appearing on this certificate at the time of issue are to be read as forming part of this certificate.

Appendix D

Sampling and Analysis Quality Plan

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

Project 84722.00
16 February 2015
PMO

Megland Group Pty Ltd
c/- PBD Architects
Level 2, 52 Albion Street
SURRY HILLS NSW 2010

Attention: Mr Tomy Chan

Dear Sirs

Sampling and Analysis Quality Plan
871 – 877 Pacific Highway, Chatswood

1. Introduction

This Sampling and Analysis Quality Plan (SAQP) has been prepared for a proposed Detailed Site Investigation (Contamination) at 871 – 877 Pacific Highway, Chatswood. The work was commissioned by Megland Group Pty Ltd, developer, in consultation with PBD Architects.

The project involves the construction of a six to seven-storey residential unit building over a one to two level basement. The new building will cover the majority of the site and it is expected that there will be limited access to subsurface soils. Most of the existing filling and soil will be excavated to form the basement. Site investigation is required to confirm that the site is suitable for the new development and to delineate any areas which may require remediation prior to or during the development works.

The Detailed Site Investigation (DSI) will be undertaken to address the requirements of *State Environmental Planning Policy No 55 – Remediation of Land*. The overall approach for the DSI will include a review of known site history, the drilling of boreholes at accessible areas on the site, the installation of groundwater monitoring wells in accessible locations, soil and groundwater sampling, laboratory analysis and interpretation of the results.

2. Purpose of Site Investigation

A DSI was commissioned by the client to support a Development Application to Willoughby City Council. The proposed investigation components of the DSI are described in the following sections.

3. Summary of Conceptual Site Model

The available site history information indicates that the site may have originally been used for residential purposes prior to redevelopment into commercial premises in the 1970s. The site immediately to the north is a Shell service station, a railway corridor is located immediately to the east, and roads are located to the south and west.

The Conceptual Site Model (CSM) has therefore been developed on the basis of the information currently available. Potential soil contamination may be present as a result of:

- The placement of filling on the site during previous redevelopment works;
- Hazardous building materials such as asbestos, lead-based paints, polychlorinated biphenyls (PCBs) etc. associated with previous demolition activities;
- Contaminants associated with vehicles (e.g. fuel, oil, solvents etc.);
- Contaminants associated with service stations that may have migrated onto the site (e.g. fuel);
- Contaminants associated with maintenance of the buildings on the site (e.g. pesticides etc.); and
- Naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals).

Potential groundwater contamination may be present as a result of:

- Contaminants associated with vehicles (e.g. fuel, oil, solvents etc.);
- Contaminants associated with service stations that may have migrated onto the site (e.g. fuel);
- Contaminants associated with maintenance of the buildings on the site (e.g. pesticides etc.);
- Naturally occurring elements in the soils and rock underlying the site (e.g. heavy metals); and
- Migration of diffuse sources of contamination onto the site.

Soil vapour intrusion and/or ground gas is currently considered to be a very low risk on the site and will only be considered if significant concentrations of volatile contaminants are encountered during the assessment.

The human receptors to soil and groundwater contamination are likely to be the occupants of and visitors to the proposed building. Construction personnel and nearby workers may also be receptors during the construction phase of the development project.

The ecological receptors are likely to be limited to the flora and fauna that grow/live on areas of the site in areas which vegetation is proposed. The area is not known to be ecologically significant.

Exposure pathways are expected to be limited to dermal contact with soils and groundwater on the site by humans, ingestion of soils and vegetation by fauna, and phytotoxic exposure to flora.

4. Data Quality Objectives

This SAQP has been devised in general accordance with the seven-step data quality objective (DQO) process outlined in Australian Standard AS 4482.1 – 2005 *Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*. The DQO process is outlined below.

(a) State The Problem

The site is to be redeveloped for residential purposes. Site Investigation is required to assess the risks associated with redeveloping so that appropriate allowances and remediation measures can be provided as part of the works, if necessary.

(b) Identify the Decision

The potential sources of contamination are outlined in the CSM above. The site has limited access for testing equipment and therefore testing will be undertaken in the areas currently accessible. Inspection of the site during demolition/construction activities will enable the currently inaccessible areas to be assessed at a later stage. A site location plan is shown in Figure 1.

Figure 1: Location of 871 – 877 Pacific Highway, Chatswood

The area of the site is understood to be 1400 m^2. The minimum recommended number of sampling locations for a site of this area is seven in accordance with *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995). Further information on the proposed sampling locations and suite of potential contaminants to be analysed is included in Sections 5 to 7 of this SAQP.

(c) Identify Inputs to the Decision

The primary inputs in assessing the presence of contamination on the site will be:

- Site history information;
- Field observations;
- Laboratory test results; and
- Published guidelines appropriate for the proposed land use (residential).

(d) Define the Boundary of the Assessment

The boundary of the assessment is shown in Figure 1. The site is legally known as Lot 1 in SP 17870.

(e) Develop a Decision Rule

The decision rule is based on the following documents:

- NSW EPA (1995); *Contaminated Sites: Sampling Design Guidelines*; and
- NEPC (2013), *National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater*. The site is assumed to be a residential site with limited access to soil for the health-based components of the assessment. Ecological-based assessment is considered necessary only in areas where vegetation is proposed (to be confirmed).

(f) Specify Acceptable Limits on Decision Errors

Appropriate quality assurance and quality control measures will be incorporated into the sampling and testing regime to ensure the quality of the assessment data. These measures are outlined in Section 8 of this SAQP.

(g) Optimise the Design for Obtaining Data

The soil sampling locations have been selected on the basis of the accessible areas on the site. Samples will be collected from different depths in the boreholes and samples will be selected for analysis to ensure a spread of depths are analysed, where relevant. Temporary groundwater wells will be installed in two of the boreholes (BH1 and BH2).

The procedures for collecting samples will be in general accordance with NEPM, EPA guidelines and/or industry best-practice. Only laboratories accredited by the National Association of Testing Authorities (NATA) will be used to analyse samples.

5. Proposed Sampling Locations

The proposed sampling points are shown on the attached sketch.

6. Proposed Sampling Methodology

Soil samples will be collected at regular depth intervals until natural soils are encountered or the rig refuses. Environmental sampling will be performed in general accordance with the standard procedures outlined in the *Douglas Partners Field Procedures Manual*. All sampling data will be recorded on chain of custody information sheets.

The soil sampling programme will generally include:

- Soil sampling using disposable equipment and/or equipment that has been decontaminated using a phosphate-free detergent;
- Placement of soil samples into laboratory prepared jars and immediate capping;
- Labelling of soil sample jars/bags with individual and unique markings including project number, sample location, sample depth and date of sampling; and
- Storage of soil sample jars in a cooled, insulated and sealed container for transport to the laboratory.

The groundwater sampling programme will generally include:

- Water sampling using equipment that has been decontaminated using a phosphate-free detergent;
- Placement of water samples into laboratory prepared bottles with appropriate preservatives (where required) and immediate capping;
- Labelling of water sample bottles with individual and unique markings including project number, sample location and date of sampling; and
- Storage of water sample bottles in a cooled, insulated and sealed container for transport to the laboratory.

In addition, laboratory prepared blank samples and spiked samples will be collected and carried during the field work to provide an indication of the potential loss of volatile hydrocarbons and to assess the adequacy of the sample handling and storage methods adopted for the assessment.

7. Proposed Laboratory Testing Programme

Selected soil samples collected during the field work will be sent to NATA accredited analytical laboratories and analysed for the following potential contaminants:

- Priority heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn);
- Total recoverable hydrocarbons (TRH);
- Monocyclic aromatic hydrocarbons (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- Organochlorine pesticides (OCP);
- Polychlorinated biphenyls (PCB);
- Phenols; and
- Asbestos.

The number of samples tested will depend on the subsurface conditions encountered during the field work. It is envisaged that, on average, one soil sample from each sampling location will be tested.

The water samples will also be tested for the contaminants listed above (excluding asbestos), plus volatile organic compounds (VOC) and hardness.

8. Quality Assurance Plan

8.1 Quality assurance & quality control in the field

Douglas Partners' quality assurance (QA) and quality control (QC) procedures will be adopted throughout the field sampling programme to ensure sampling precision and accuracy and to prevent cross-contamination. We will check sampling accuracy and precision through the analysis of triplicate samples in both the primary and a secondary analytical laboratory. The potential for cross-contamination and loss of volatile compounds will be assessed using trip blank and trip spike samples.

Appropriate sampling procedures will be undertaken to ensure that cross-contamination does not occur as outlined in the *Douglas Partners Field Procedures Manual*. This specifies that:

- Standard operating procedures are to be followed;
- Site safety plans are to be developed prior to commencing the works;
- Triplicate field samples are to be collected and analysed;
- Samples are to be stored under secure, temperature-controlled conditions;
- Chain of custody documentation is to be employed for the handling, transport and delivery of samples to the selected laboratory; and

- Contaminated filling, soil and groundwater originating from the site is to be disposed of in accordance with relevant regulatory guidelines.

8.2 Quality assurance & quality control in the laboratory

The analytical laboratories used during the assessment will conduct in-house QA/QC procedures including:

- Analysis of reagent blanks;
- Spike recovery analysis;
- Laboratory duplicate analysis;
- Analysis of control standards;
- Analysis of calibration standards and blanks; and
- Statistical analysis of QC data.

8.3 Data quality indicators

The following data quality indicators (DQIs) will need to be achieved during the analysis of QA/QC samples:

- Conformance with specified holding times;
- Accuracy of spiked samples to generally be in the range of 70% to 130%;
- Field triplicate samples to be collected at a frequency of at least 10% of all samples; and
- Field and laboratory duplicate samples to have a precision average within a 30% relative percent difference (RPD) unless circumstances allow a greater range.

Please contact the undersigned if further information is required.

Yours faithfully,
Douglas Partners Pty Ltd

Peter Oitmaa
Senior Associate

Attachment: Sketch

Geotech borehole

Enviro borehole

Douglas Partners
Geotechnics / Environment / Groundwater

Proposed Borehole Locations
871-877 Pacific Highway
CHATSWOOD

CLIENT: Megland Group Pty Ltd

PROJECT:	84722
DWG No:	0
REV:	A
DATE:	16-Feb-15

Appendix E

Field Work Results

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 107.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 84722
DATE: 18/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
107	0.03	ASPHALT		A	0.1				
	0.25	FILLING - dark grey, sandy, fine to coarse gravel filling, humid		A	0.5				
	0.7	FILLING - grey brown, fine grained sand with some silt and some brick fragments, humid							
	1	CLAY - stiff, light brown to brown and red clay with a trace of fine grained sand, humid		A	1.0				
				S	1.45		2,5,6 N = 11		
106	2								
	2.6			S	2.5 2.59		25/90 refusal		
105	3	SHALE - extremely low to very low strength, extremely to highly weathered, fragmented to fractured light grey and red brown shale with some low and medium strength ironstone bands			2.6				
	3.0			C					
					3.5				
104	4			C	3.7		pp = 350		
					4.0				
				C	4.2		pp = 370		
103	5				4.95				
				C	5.25		pp >600		
					5.4		PL(A) = 0.9		
					5.7				
102	6			C					
	6.0	SHALE - very low and low strength, highly to moderately weathered, fractured and slightly fractured grey brown shale with some fine sandstone laminations			6.25		PL(A) = 0.2		
					6.3				
101	7			C					
	7.2	SHALE - medium strength, fresh, slightly fractured grey shale			7.4		PL(A) = 0.4		
					7.65				
100	8			C					
					8.1		PL(A) = 0.4		
	8.25	Bore discontinued at 8.25m			8.2				
99	9								
98									

RIG: DT 100 **DRILLER:** LC **LOGGED:** SI/MP **CASING:** HW to 2.6m

TYPE OF BORING: Solid flight auger to 2.5m; Rotary to 2.6m; NMLC Coring to 8.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 8.25m; Screen 2.25 to 8.25m, Gravel 1.7 to 8.25m, Bentonite 1.3 to 1.7m, Backfill to GL with gatic cover

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$_x$	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 107.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
107	0.03	ASPHALT		A	0.1				
	0.2	FILLING - dark grey, sandy, fine to coarse gravel filling, humid		A	0.5				
	0.6	FILLING - red grey, fine grained sand with some gravel and some brick fragments, humid							
	1	CLAY - stiff, light brown, brown and red clay with a trace of fine grained sand, humid		A	1.0				
				S	1.45		3,6,5 N = 11		
106	2								
	2.5	SHALE - extremely low to very low strength, extremely to highly weathered, fractured and slightly fractured, light grey brown and red brown shale with medium strength ironstone bands		C	2.5				
105	3								
					3.4		pp = 250		
					3.5				
					3.7		PL(A) = 1.3		
104	4			C	4.2		pp = 300		
					4.7		PL(A) = 0.3		
103	5				4.9				
					5.4		pp = 400		
	5.5	SHALE - very low strength, highly to moderately weathered, slightly fractured, grey brown shale with some fine sandstone laminations and low strength bands		C					
102	6				6.3				
101	7			C					
	7.3	SHALE - low strength, highly to moderately weathered, slightly fractured, grey brown shale							
	7.8	Bore discontinued at 7.8m			7.75 7.8		PL(A) = 0.2		
100	8								
99	9								
98									

RIG: DT 100 **DRILLER:** DL **LOGGED:** SI/MP **CASING:** HW to 1.1m

TYPE OF BORING: Solid flight auger to 1.0m; Rotary to 2.5m; NMLC Coring to 7.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 7.8m; Screen 1.8 to 7.8m, Gravel 1.5 to 7.8m, Bentonite 1.0 to 1.5m, Backfill to GL with gatic cover

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_x	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 107.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 1A
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.02	ASPHALT			0.02				
		FILLING - grey, fine to medium grained sandy gravel filling, moist (roadbase)		D/E	0.1		PID<1		
	0.2	FILLING - grey-brown, silty clay filling with some gravel and a trace of possible fibre cement, moist							
				D/E	0.4		PID<1		
	0.5	CLAY - red and grey-brown clay, moist			0.5				
107									
				D/E	0.9		PID<1		
	1 1.0	Bore discontinued at 1.0m - target stratum reached			1.0				1
106									

RIG: 3.5T Excavator **DRILLER:** A & A Hire **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: 150mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
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$_x$	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 107.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 2A
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.02	ASPHALT			0.02				
		FILLING - grey, fine to medium grained sandy gravel filling, moist (roadbase)		D/E	0.1		PID<1		
	0.2	FILLING - brown, gravelly clay filling, moist							
				D/E	0.4		PID<1		
	0.5	CLAY - grey-brown clay, moist			0.5				
107									
				D/E	0.9		PID<1		
	1 1.0	Bore discontinued at 1.0m - target stratum reached			1.0				1
106									

RIG: DT 100 **DRILLER:** LC **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: 100mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
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$_x$	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 108.0 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
108	0.02	ASPHALT							
		FILLING - red-brown, medium to coarse grained gravelly sand filling with some bricks, moist (possible crushed brick)		D/E	0.1		PID<1		
					0.2				
	0.3	CLAY - brown clay with a trace of rootlets, moist							
				D/E	0.4		PID<1		
					0.5				
				D/E*	0.9		PID<1		
107	1.0	Bore discontinued at 1.0m - target stratum reached			1.0				1

RIG: 3.5T Excavator **DRILLER:** A & A Hire **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: 150mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: *Triplicate samples TS1A and TS1b collected

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_x	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 108.2 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
108	0.06	BRICK PAVERS							
	0.09	FILLING - light brown, medium grained sand filling, damp (paving sand)		D/E	0.09		PID<1		
	0.15	FILLING - grey, fine to medium grained sandy gravel filling, damp (roadbase)		D/E	0.15		PID<1		
	0.3	FILLING - grey-brown, silty clay filling with some gravel, some brick fragments and some PVC fragments, damp		D/E	0.3		PID<1		
	0.4	CLAY - brown clay, damp			0.4				
	1	Bore discontinued at 0.4m - target stratum reached							1
107									

RIG: Hand tools **DRILLER:** AL **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: Diatube to 0.06m; Hand auger to 0.4m
WATER OBSERVATIONS: No free groundwater observed
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_x	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 108.2 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
108	0.02	ASPHALT			0.02				
		FILLING - red-brown, medium to coarse grained gravelly sand filling, moist (possible crushed brick)		D/E	0.1		PID<1		
	0.2	FILLING - grey-brown, silty clay filling with some gravel, moist							
				D/E	0.4		PID<1		
	0.5	CLAY - brown clay, moist			0.5				
				D/E	0.9		PID<1		
107	1 1.0	Bore discontinued at 1.0m - target stratum reached			1.0				1

RIG: 3.5T Excavator **DRILLER:** A & A Hire **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: 150mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
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_x	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 108.1 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
108	0.06	BRICK PAVERS							
	0.1	FILLING - light brown, medium grained sand filling, damp (paving sand)		D/E	0.06 0.1		PID<1		
		FILLING - grey, fine to medium grained sandy gravel filling, damp (roadbase)		D/E			PID<1		
	0.25	FILLING - grey-brown, silty clay filling with some gravel, damp			0.25 0.3				
				D/E			PID<1		
	0.45	CLAY - brown clay, wet			0.45 0.5				
				D/E			PID<1		
	0.6	Bore discontinued at 0.6m - target stratum reached			0.6				
	1								1
107									

RIG: Hand tools **DRILLER:** AL **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: Diatube to 0.06m; Hand auger to 0.6m
WATER OBSERVATIONS: No free groundwater observed
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$_x$	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Megland Group Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 871-877 Pacific Highway, Chatswood

SURFACE LEVEL: 107.8 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 7
PROJECT No: 84722
DATE: 19/2/2015
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
107	0.0	FILLING - brown, sandy clay filling with some roots and some gravel, moist		D/E	0.0		PID<1		
					0.1				
				D/E*	0.4		PID<1		
	0.5	CLAY - brown clay, moist			0.5				
				D/E	0.9		PID<1		
	1 1.0	Bore discontinued at 1.0m - target stratum reached			1.0				1
106									

RIG: 3.5T Excavator **DRILLER:** A & A Hire **LOGGED:** AL **CASING:** Uncased
TYPE OF BORING: 150mm diameter solid flight auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS: *Triplicate samples TS2A and TS2B collected

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_x	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	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Appendix F

Summary of Laboratory Test Results

Table F1: Contaminant Concentrations in Soils

Sample/ Depth (m)	B	T	E	X	F1	F2	F3	+PAH	B.TEQ	B(a)P	+OCP	+PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Primary Samples – Filling																						
BH1A/0.4-0.5	<0.2	<0.5	<1	<3	<25	<50	<100	24	3.5	2.5	NIL	NIL	<5	Y	6	<0.4	32	13	87	<0.1	13	100
BH2A/0.02-0.1	<0.2	<0.5	<1	<3	<25	<50	260	0.16	<0.5	<0.05	NIL	NIL	<5	N	<4	<0.4	61	51	6	<0.1	76	51
BH3/0.1-0.2	<0.2	<0.5	<1	<3	<25	<50	<100	23	3.4	2.4	NIL	NIL	<5	N	10	0.5	18	46	230	0.1	16	290
BH4/0.15-0.3	<0.2	<0.5	<1	<3	<25	<50	<100	9.3	1.6	1.1	NIL	NIL	<5	N	50	0.4	21	49	560	0.1	7	280
BH6/0.3-0.45	<0.2	<0.5	<1	<3	<25	<50	<100	1.7	<0.5	0.2	NIL	NIL	<5	Y	6	0.5	32	55	260	0.4	14	260
BH7/0.4-0.5	<0.2	<0.5	<1	<3	<25	<50	<100	3.2	<0.5	0.3	NIL	NIL	<5	N	7	0.7	32	26	110	0.1	5	89
Primary Samples – Natural Soil																						
BH5/0.9-1.0	<0.2	<0.5	<1	<3	<25	<50	<100	NIL	<0.5	<0.05	NIL	NIL	<5	NT	5	<0.4	26	6	50	<0.1	3	27
QA/QC Samples																						
Blank	<0.2	<0.5	<1	<3	<25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Spike	97%	98%	96%	96%	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TS2A (BH7/0.4-0.5)	<0.2	<0.5	<1	<3	<25	<50	<100	NIL	<0.5	<0.05	NIL	NIL	<5	NT	7	0.4	30	7	49	<0.1	3	29
TS2B (BH7/0.4-0.5)	<0.1	<0.1	<0.1	<0.3	<20	<50	<100	<0.5	<0.5	<0.5	NIL	NIL	<0.5	NT	7.1	0.5	35	23	130	0.09	<5	73

Notes: B = Benzene; T = Toluene; E = Ethylbenzene; X = Xylene; Napth. = Naphthalene; F1 = (C_6 – C_{10}) – BTEX; F2 = (C_{11} – C_{16}) – Naphthalene; +PAH = Positive polycyclic aromatic hydrocarbons; B.TEQ = Carcinogenic PAHs (as B(a)P TEQ); B(a)P = Benzo(a)pyrene OCP = Organochlorine pesticides; PCB = Polychlorinated biphenyls; As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead; Hg = Mercury; Ni = Nickel; Zn = Zinc; NIL = below detection limits; NT = not tested

Table F2: Adopted Comparative Criteria for Soils

Sample/ Depth (m)	B	T	E	X	F1	F2	F3	+PAH	B.TEQ	B(a)P	OCP	PCB	Phenol	Asbestos	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(Y/N)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Adopted Investigation/Screening Levels (mg/kg)																						
Health-Based[1]	0.5	160	55	40	45	110		400	4		Various	1	45000		500	150	500	30000	1200	120	1200	60000
Ecological[2]	50	85	70	105	180	120	300			0.7					100		400	280	1100		170	260

Notes: B = Benzene; T = Toluene; E = Ethylbenzene; X = Xylene; Napth. = Naphthalene; F1 = (C_6 – C_{10}) – BTEX; F2 = (C_{11} – C_{16}) – Naphthalene; F3 = (C_{16} – C_{34}); +PAH = Positive polycyclic aromatic hydrocarbons; B.TEQ = Carcinogenic PAHs (as B(a)P TEQ); B(a)P = Benzo(a)pyrene; OCP = Organochlorine pesticides; PCB = Polychlorinated biphenyls; As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead; Hg = Mercury; Ni = Nickel; Zn = Zinc

[1]Based on NEPM Urban Residential High Density Sites; [2]Based on NEPM ESL/ACL + measured natural soil concentration

Appendix G

Detailed Laboratory Test Results

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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CERTIFICATE OF ANALYSIS 124022

Client:

Douglas Partners Pty Ltd
96 Hermitage Rd
West Ryde
NSW 2114

Attention: Peter Oitmaa

Sample log in details:

Your Reference:	**84722, Chatswood**
No. of samples:	10 Soils 1 Water
Date samples received / completed instructions received	23/02/2015 / 23/02/2015

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	2/03/15 / 2/03/15
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	83	82	83	81

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	124022-6	124022-7	124022-8	124022-9	124022-10
Your Reference	----------	BH6	BH7	TS 2A	Blank	Spike
Depth	----------	0.3-0.45	0.4-0.5	-	-	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	[NA]
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	[NA]
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	97%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	98%
Ethylbenzene	mg/kg	<1	<1	<1	<1	96%
m+p-xylene	mg/kg	<2	<2	<2	<2	96%
o-Xylene	mg/kg	<1	<1	<1	<1	97%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	79	76	76	84	97

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	120	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	160	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	260	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	78	80	83	82	80

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	81	78	81

PAHs in Soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.4	<0.1	0.2	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.1	0.2	1.7	0.4	<0.1
Anthracene	mg/kg	0.3	<0.1	0.4	<0.1	<0.1
Fluoranthene	mg/kg	3.5	<0.1	3.8	1.4	<0.1
Pyrene	mg/kg	4.1	<0.1	3.6	1.4	<0.1
Benzo(a)anthracene	mg/kg	2.4	<0.1	1.9	0.8	<0.1
Chrysene	mg/kg	2.4	<0.1	1.9	0.9	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	3.6	<0.2	3.8	2	<0.2
Benzo(a)pyrene	mg/kg	2.5	<0.05	2.4	1.1	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	1.4	<0.1	1.3	0.7	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.3	<0.1	0.3	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	1.4	<0.1	1.3	0.6	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	3.5	<0.5	3.4	1.6	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	3.5	<0.5	3.4	1.6	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	3.5	<0.5	3.4	1.6	<0.5
Total Positive PAHs	mg/kg	24	0.16	23	9.3	NIL (+)VE
Surrogate p-Terphenyl-d14	%	95	103	101	102	101

PAHs in Soil				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.5	<0.1
Pyrene	mg/kg	0.3	0.5	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.3	<0.1
Chrysene	mg/kg	0.2	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.4	0.6	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.3	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.5	<0.5
Total Positive PAHs	mg/kg	1.7	3.2	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	100	104

Organochlorine Pesticides in soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	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
delta-BHC	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
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-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
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	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
Endosulfan Sulphate	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
Surrogate TCMX	%	80	87	84	85	85

Organochlorine Pesticides in soil				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	86	71

PCBs in Soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
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
Surrogate TCLMX	%	80	87	84	85	85

PCBs in Soil				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	84	86	71

Acid Extractable metals in soil						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Arsenic	mg/kg	6	<4	10	50	5
Cadmium	mg/kg	<0.4	<0.4	0.5	0.4	<0.4
Chromium	mg/kg	32	61	18	21	26
Copper	mg/kg	13	51	46	49	6
Lead	mg/kg	87	6	230	560	50
Mercury	mg/kg	<0.1	<0.1	0.1	0.1	<0.1
Nickel	mg/kg	13	76	16	7	3
Zinc	mg/kg	100	51	290	280	27

Acid Extractable metals in soil				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date digested	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015
Arsenic	mg/kg	6	7	7
Cadmium	mg/kg	0.5	0.7	0.4
Chromium	mg/kg	32	32	30
Copper	mg/kg	55	26	7
Lead	mg/kg	260	110	49
Mercury	mg/kg	0.4	0.1	<0.1
Nickel	mg/kg	14	5	3
Zinc	mg/kg	260	89	29

Misc Soil - Inorg						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference:	UNITS	124022-6	124022-7	124022-8
Your Reference	----------	BH6	BH7	TS 2A
Depth	----------	0.3-0.45	0.4-0.5	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil
Date prepared	-	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	25/02/2015	25/02/2015	25/02/2015
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-5
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH5
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.9-1.0
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Moisture	%	21	5.0	11	16	25

Moisture					
Our Reference:	UNITS	124022-6	124022-7	124022-8	124022-9
Your Reference	----------	BH6	BH7	TS 2A	Blank
Depth	----------	0.3-0.45	0.4-0.5	-	-
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Date analysed	-	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Moisture	%	21	15	19	<0.1

Asbestos ID - soils						
Our Reference:	UNITS	124022-1	124022-2	124022-3	124022-4	124022-6
Your Reference	----------	BH1A	BH2A	BH3	BH4	BH6
Depth	----------	0.4-0.5	0.02-0.1	0.1-0.2	0.15-0.3	0.3-0.45
Date Sampled		19/02/2015	19/02/2015	19/02/2015	19/02/2015	19/02/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Sample mass tested	g	70.54g	Approx 90g	Approx 90g	Approx 70g	104.41g
Sample Description	-	Brown coarse grain soil & rocks	Dark grey coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	Chrysotile asbestos detected Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	Chrysotile asbestos detected Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference:	UNITS	124022-7
Your Reference	----------	BH7
Depth	----------	0.4-0.5
Date Sampled		19/02/2015
Type of sample		Soil
Date analysed	-	26/02/2015
Sample mass tested	g	Approx 65g
Sample Description	-	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	124022-11
Your Reference	----------	R1
Depth	----------	-
Date Sampled		19/02/2015
Type of sample		Water
Date extracted	-	24/02/2015
Date analysed	-	24/02/2015
TRHC$_6$ - C$_9$	µg/L	<10
TRHC$_6$ - C$_{10}$	µg/L	<10
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	115
Surrogate toluene-d8	%	96
Surrogate 4-BFB	%	100

svTRH (C10-C40) in Water		
Our Reference:	UNITS	124022-11
Your Reference	----------	R1
Depth	----------	-
Date Sampled		19/02/2015
Type of sample		Water
Date extracted	-	25/02/2015
Date analysed	-	25/02/2015
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50
TRH>C$_{16}$ - C$_{34}$	µg/L	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100
Surrogate o-Terphenyl	%	91

PAHs in Water		
Our Reference:	UNITS	124022-11
Your Reference	----------	R1
Depth	----------	-
Date Sampled		19/02/2015
Type of sample		Water
Date extracted	-	25/02/2015
Date analysed	-	25/02/2015
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	112

Metals in Water - Dissolved		
Our Reference:	UNITS	124022-11
Your Reference	----------	R1
Depth	----------	-
Date Sampled		19/02/2015
Type of sample		Water
Date digested	-	26/02/2015
Date analysed	-	26/02/2015
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Date analysed	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	124022-1	<25 || <25	LCS-3	102%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	124022-1	<25 || <25	LCS-3	102%
Benzene	mg/kg	0.2	Org-016	<0.2	124022-1	<0.2 || <0.2	LCS-3	93%
Toluene	mg/kg	0.5	Org-016	<0.5	124022-1	<0.5 || <0.5	LCS-3	96%
Ethylbenzene	mg/kg	1	Org-016	<1	124022-1	<1 || <1	LCS-3	104%
m+p-xylene	mg/kg	2	Org-016	<2	124022-1	<2 || <2	LCS-3	108%
o-Xylene	mg/kg	1	Org-016	<1	124022-1	<1 || <1	LCS-3	106%
naphthalene	mg/kg	1	Org-014	<1	124022-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	86	124022-1	80 || 83 || RPD: 4	LCS-3	87%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Date analysed	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	124022-1	<50 || <50	LCS-3	96%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	124022-1	<100 || <100	LCS-3	98%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	124022-1	<100 || <100	LCS-3	74%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	124022-1	<50 || <50	LCS-3	96%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	124022-1	<100 || <100	LCS-3	98%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	124022-1	<100 || <100	LCS-3	74%
Surrogate o-Terphenyl	%		Org-003	83	124022-1	78 || 87 || RPD: 11	LCS-3	92%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Date analysed	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	0.1 || <0.1	LCS-3	101%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	0.4 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	<0.1 || <0.1	LCS-3	105%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	1.1 || 0.3 || RPD: 114	LCS-3	98%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	0.3 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	3.5 || 0.8 || RPD: 126	LCS-3	98%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	4.1 || 0.9 || RPD: 128	LCS-3	115%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	2.4 || 0.5 || RPD: 131	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	2.4 || 0.5 || RPD: 131	LCS-3	99%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	124022-1	3.6 || 0.8 || RPD: 127	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	124022-1	2.5 || 0.53 || RPD: 130	LCS-3	107%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	1.4 || 0.3 || RPD: 129	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	0.3 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	124022-1	1.4 || 0.3 || RPD: 129	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	103	124022-1	95 || 102 || RPD: 7	LCS-3	96%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Date analysed	-			26/02/2015	124022-1	26/02/2015 || 26/02/2015	LCS-3	26/02/2015
HCB	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	82%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	91%
Heptachlor	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	80%
delta-BHC	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	83%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	83%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	91%
Dieldrin	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	83%
Endrin	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	86%
pp-DDD	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	LCS-3	83%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	82	124022-1	80 || 81 || RPD: 1	LCS-3	81%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-3	25/02/2015
Date analysed	-			26/02/2015	124022-1	26/02/2015 || 26/02/2015	LCS-3	26/02/2015
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	LCS-3	107%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	124022-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	82	124022-1	80 || 81 || RPD: 1	LCS-3	99%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-5	25/02/2015
Date analysed	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-5	25/02/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	124022-1	6 || 7 || RPD: 15	LCS-5	113%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	124022-1	<0.4 || <0.4	LCS-5	109%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	124022-1	32 || 30 || RPD: 6	LCS-5	110%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	124022-1	13 || 12 || RPD: 8	LCS-5	111%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	124022-1	87 || 83 || RPD: 5	LCS-5	105%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	124022-1	<0.1 || <0.1	LCS-5	89%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	124022-1	13 || 11 || RPD: 17	LCS-5	107%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	124022-1	100 || 98 || RPD: 2	LCS-5	107%

QUALITY CONTROL Misc Soil - Inorg	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-1	25/02/2015
Date analysed	-			25/02/2015	124022-1	25/02/2015 || 25/02/2015	LCS-1	25/02/2015
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	124022-1	<5 || <5	LCS-1	101%
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2015	[NT]	[NT]	LCS-W3	24/02/2015
Date analysed	-			24/02/2015	[NT]	[NT]	LCS-W3	24/02/2015
TRHC$_{6}$ - C$_{9}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	88%
TRHC$_{6}$ - C$_{10}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	88%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	89%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	84%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	90%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W3	88%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	87%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	110	[NT]	[NT]	LCS-W3	113%
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	LCS-W3	99%
Surrogate 4-BFB	%		Org-016	98	[NT]	[NT]	LCS-W3	112%
QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	[NT]	[NT]	LCS-W2	25/02/2015
Date analysed	-			25/02/2015	[NT]	[NT]	LCS-W2	25/02/2015
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W2	104%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	97%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	79%
TRH>C$_{10}$ - C$_{16}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W2	104%
TRH>C$_{16}$ - C$_{34}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	97%
TRH>C$_{34}$ - C$_{40}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	79%
Surrogate o-Terphenyl	%		Org-003	93	[NT]	[NT]	LCS-W2	80%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/02/2015	[NT]	[NT]	LCS-W1	25/02/2015
Date analysed	-			25/02/2015	[NT]	[NT]	LCS-W1	25/02/2015
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	87%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	90%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	87%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	86%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	102%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	80%
Benzo(b,j+k) fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	90%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	121	[NT]	[NT]	LCS-W1	111%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			26/02/2015	[NT]	[NT]	LCS-W2	25/02/2015
Date analysed	-			26/02/2015	[NT]	[NT]	LCS-W2	25/02/2015
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W2	96%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W2	101%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W2	100%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W2	98%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W2	98%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W2	100%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W2	100%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W2	98%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	25/02/2015 || 25/02/2015	124022-2	26/02/2015
TRHC$_6$ - C$_9$	mg/kg	124022-8	<25 || <25	124022-2	105%
TRHC$_6$ - C$_{10}$	mg/kg	124022-8	<25 || <25	124022-2	105%
Benzene	mg/kg	124022-8	<0.2 || <0.2	124022-2	97%
Toluene	mg/kg	124022-8	<0.5 || <0.5	124022-2	101%
Ethylbenzene	mg/kg	124022-8	<1 || <1	124022-2	106%
m+p-xylene	mg/kg	124022-8	<2 || <2	124022-2	110%
o-Xylene	mg/kg	124022-8	<1 || <1	124022-2	109%
naphthalene	mg/kg	124022-8	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	124022-8	76 || 78 || RPD: 3	124022-2	87%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	124022-8	<50 || <50	124022-2	94%
TRHC$_{15}$ - C$_{28}$	mg/kg	124022-8	<100 || <100	124022-2	106%
TRHC$_{29}$ - C$_{36}$	mg/kg	124022-8	<100 || <100	124022-2	#
TRH>C$_{10}$-C$_{16}$	mg/kg	124022-8	<50 || <50	124022-2	94%
TRH>C$_{16}$-C$_{34}$	mg/kg	124022-8	<100 || <100	124022-2	106%
TRH>C$_{34}$-C$_{40}$	mg/kg	124022-8	<100 || <100	124022-2	#
Surrogate o-Terphenyl	%	124022-8	81 || 81 || RPD: 0	124022-2	92%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Naphthalene	mg/kg	124022-8	<0.1 || <0.1	124022-2	103%
Acenaphthylene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	124022-8	<0.1 || <0.1	124022-2	107%
Phenanthrene	mg/kg	124022-8	<0.1 || <0.1	124022-2	103%
Anthracene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	124022-8	<0.1 || <0.1	124022-2	103%
Pyrene	mg/kg	124022-8	<0.1 || <0.1	124022-2	121%
Benzo(a)anthracene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	124022-8	<0.1 || <0.1	124022-2	102%
Benzo(b,j+k)fluoranthene	mg/kg	124022-8	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	124022-8	<0.05 || <0.05	124022-2	118%
Indeno(1,2,3-c,d)pyrene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	124022-8	104 || 100 || RPD: 4	124022-2	101%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	26/02/2015 || 26/02/2015	124022-2	26/02/2015
HCB	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	124022-8	<0.1 || <0.1	124022-2	84%
gamma-BHC	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	124022-8	<0.1 || <0.1	124022-2	93%
Heptachlor	mg/kg	124022-8	<0.1 || <0.1	124022-2	82%
delta-BHC	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	124022-8	<0.1 || <0.1	124022-2	85%
Heptachlor Epoxide	mg/kg	124022-8	<0.1 || <0.1	124022-2	84%
gamma-Chlordane	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	124022-8	<0.1 || <0.1	124022-2	92%
Dieldrin	mg/kg	124022-8	<0.1 || <0.1	124022-2	84%
Endrin	mg/kg	124022-8	<0.1 || <0.1	124022-2	87%
pp-DDD	mg/kg	124022-8	<0.1 || <0.1	124022-2	101%
Endosulfan II	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	124022-8	<0.1 || <0.1	124022-2	82%
Methoxychlor	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%	124022-8	71 || 71 || RPD: 0	124022-2	82%

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	26/02/2015 || 26/02/2015	124022-2	26/02/2015
Arochlor 1016	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	124022-8	<0.1 || <0.1	124022-2	99%
Arochlor 1260	mg/kg	124022-8	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	124022-8	71 || 71 || RPD: 0	124022-2	94%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Date analysed	-	124022-8	25/02/2015 || 25/02/2015	124022-2	25/02/2015
Arsenic	mg/kg	124022-8	7 || 8 || RPD: 13	124022-2	90%
Cadmium	mg/kg	124022-8	0.4 || 0.5 || RPD: 22	124022-2	84%
Chromium	mg/kg	124022-8	30 || 33 || RPD: 10	124022-2	99%
Copper	mg/kg	124022-8	7 || 6 || RPD: 15	124022-2	91%
Lead	mg/kg	124022-8	49 || 48 || RPD: 2	124022-2	82%
Mercury	mg/kg	124022-8	<0.1 || <0.1	124022-2	102%
Nickel	mg/kg	124022-8	3 || 3 || RPD: 0	124022-2	88%
Zinc	mg/kg	124022-8	29 || 26 || RPD: 11	124022-2	79%
QUALITY CONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	124022-2	25/02/2015
Date analysed	-	[NT]	[NT]	124022-2	25/02/2015
Total Phenolics (as Phenol)	mg/kg	[NT]	[NT]	124022-2	103%

Report Comments:

Total Recoverable Hydrocarbons in soil: # Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample/s.

PAH_S:The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Sample 124022-1; Chrysotile asbestos identified embedded in a fragment of fibre cement and as loose fibre bundles (total weight 0.3175g). In 70.54g of soil this calculates to 4.50g/kg, which is calculated as greater than the reporting limit for the method (i.e. > 0.1g/kg).

Sample 124022-6; Chrysotile asbestos identified in matted material and as loose fibre bundles (total weight 0.3419g). In 104.41g of soil this calculates to 3.27g/kg, which is greater than the reporting limit for the method (i.e. < 0.1g/kg).

Asbestos ID was analysed by Approved Identifier: Lulu Guo
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECIEPT ADVICE

Client Details	
Client	Douglas Partners Pty Ltd
Attention	Peter Oitmaa

Sample Login Details	
Your Reference	84722, Chatswood
Envirolab Reference	124022
Date Sample Received	23/02/2015
Date Instructions Received	23/02/2015
Date Results Expected to be Reported	02/03/2015

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	10 Soils 1 Water
Turnaround Time Requested	Standard
Temperature on receipt (°C)	13.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolabservices.com.au	Email: jhurst@envirolabservices.com.au

Sample and Testing Details on following page

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

Sample Id	*Acid Extractable metals in soil*	*Asbestos ID - soils*	*Metals in Water - Dissolved*	*Organochlorine Pesticides in soil*	*PAHs in Water*	*PAHs in Soil*	*PCBs in Soil*	*svTRH (C10-C40) in Soil*	*svTRH (C10-C40) in Water*	*Total Phenolics (as Phenol)*	*vTRH(C6-C10)/BTEXN in Soil*	*vTRH(C6-C10)/BTEXN in Water*
BH1A-0.4-0.5	✓	✓		✓		✓	✓	✓		✓	✓	
BH2A-0.02-0.1	✓	✓		✓		✓	✓	✓		✓	✓	
BH3-0.1-0.2	✓	✓		✓		✓	✓	✓		✓	✓	
BH4-0.15-0.3	✓	✓		✓		✓	✓	✓		✓	✓	
BH5-0.9-1.0	✓			✓		✓	✓	✓		✓	✓	
BH6-0.3-0.45	✓	✓		✓		✓	✓	✓		✓	✓	
BH7-0.4-0.5	✓	✓		✓		✓	✓	✓		✓	✓	
TS 2A	✓			✓		✓	✓	✓		✓	✓	
Blank											✓	
Spike											✓	
R1			✓		✓				✓			✓

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Chatswood
Project No: 84722 Sampler: AL
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: peter.oitmaa@douglaspartners.com.au
Date Required: Std Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2067
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type S - soil W - water	Container type	Analytes: 8 Heavy metals	TRH BTEX	PAH	OCP/PCB	Phenol	Asbestos			Notes
BH1A	0.4-0.5	1	19/2	S	Jar/Bag									
BH2A	0.02-01	2												
BH3	0.1-02	3												
BH4	0.15-0.3	4												
BH5	0.9-1.8	5			Jar									
BH6	0.3-0.45	6			Jar/Bag									
BH7	0.4-0.5	7												
TS 2A	-	8			Jar									
TS 2B	-													Send to Eurofins
Blank	-	9												
Spike	-	10												
R1	-	11		W	Bottles	✓	✓	✓						

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 124022
Date Received: 23.02.15
Time Received: 18:00
Received by: D.F.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Lab Report No.
Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114
Phone: (02) 9809 0666
Fax: (02) 9809 4095

Relinquished by:	Signed:	Date & Time:	Received By: Daniel Farol, ELS	Date & Time: 23.02.15 / 18:00
Relinquished by:	Signed:	Date & Time:	Received By:	Date & Time:

eurofins | mgt

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114

Attention: **Peter Oitmaa**

Report **448554-S**
Project name CHATSWOOD
Project ID 84722
Received Date Feb 24, 2015

Client Sample ID			**TS2B**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S15-Fe18353**
Date Sampled			**Not Provided**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5

Client Sample ID			TS2B
Sample Matrix			Soil
Eurofins | mgt Sample No.			S15-Fe18353
Date Sampled			Not Provided
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96
p-Terphenyl-d14 (surr.)	1	%	107
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	1	mg/kg	< 1
Dibutylchlorendate (surr.)	1	%	87
Tetrachloro-m-xylene (surr.)	1	%	78
Polychlorinated Biphenyls (PCB)			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5
Total PCB*	0.5	mg/kg	< 0.5
Dibutylchlorendate (surr.)	1	%	87
Speciated Phenols			
2.4-Dichlorophenol	0.5	mg/kg	< 0.5
2.4-Dimethylphenol	0.5	mg/kg	< 0.5
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5
Phenol	0.5	mg/kg	< 0.5
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5

Client Sample ID			TS2B
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S15-Fe18353**
Date Sampled			**Not Provided**
Test/Reference	LOR	Unit	
Speciated Phenols			
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1
2-Chlorophenol	0.5	mg/kg	< 0.5
2-Nitrophenol	0.5	mg/kg	< 0.5
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5
Pentachlorophenol	1	mg/kg	< 1
Phenol-d5 (surr.)	1	%	90
Heavy Metals			
Arsenic	2	mg/kg	7.1
Cadmium	0.4	mg/kg	0.5
Chromium	5	mg/kg	35
Copper	5	mg/kg	23
Lead	5	mg/kg	130
Mercury	0.05	mg/kg	0.09
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	73
% Moisture	0.1	%	18

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 25, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 25, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Sydney	Feb 25, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 25, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Organochlorine Pesticides	Sydney	Feb 25, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Feb 25, 2015	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Speciated Phenols	Sydney	Feb 25, 2015	14 Day
- Method: E008 Speciated Phenols			
Metals M8	Sydney	Feb 25, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Feb 24, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: CHATSWOOD
Project ID: 84722

Order No.:
Report #: 448554
Phone: 02 9809 0666
Fax:

Received: Feb 24, 2015 2:10 PM
Due: Mar 3, 2015
Priority: 5 Day
Contact Name: Peter Oitmaa

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	BTEX	Polychlorinated Biphenyls (PCB)	Speciated Phenols	Total Recoverable Hydrocarbons	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
TS2B	Not Provided		Soil	S15-Fe18353	X	X	X	X	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

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 LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, 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 'Sample Preservation and Container Guide' for holding times (QS3001).

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 Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably 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 RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity 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 Environmental Protection Agency
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
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

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 the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

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 at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Speciated Phenols							
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.6-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.5			0.5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 1			1	Pass	
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2-Nitrophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 0.5			0.5	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	86			70-130	Pass	
TRH C10-C14	%	99			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	91			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
o-Xylene	%	89			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	104			70-130	Pass	
TRH C6-C10	%	80			70-130	Pass	
TRH >C10-C16	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	102			70-130	Pass	
Acenaphthylene	%	97			70-130	Pass	
Anthracene	%	106			70-130	Pass	
Benz(a)anthracene	%	101			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	109			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a.h)anthracene	%	114			70-130	Pass	
Fluoranthene	%	106			70-130	Pass	
Fluorene	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	111			70-130	Pass	
Naphthalene	%	102			70-130	Pass	
Phenanthrene	%	96			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	113			70-130	Pass	
4.4'-DDD	%	112			70-130	Pass	
4.4'-DDE	%	114			70-130	Pass	
4.4'-DDT	%	113			70-130	Pass	
a-BHC	%	112			70-130	Pass	
Aldrin	%	108			70-130	Pass	
b-BHC	%	115			70-130	Pass	
d-BHC	%	94			70-130	Pass	
Dieldrin	%	113			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	110			70-130	Pass	
Endosulfan sulphate	%	116			70-130	Pass	
Endrin	%	116			70-130	Pass	
Endrin aldehyde	%	102			70-130	Pass	
Endrin ketone	%	117			70-130	Pass	
g-BHC (Lindane)	%	112			70-130	Pass	
Heptachlor	%	115			70-130	Pass	
Heptachlor epoxide	%	112			70-130	Pass	
Methoxychlor	%	113			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	83			70-130	Pass	
LCS - % Recovery							
Speciated Phenols							
2.4-Dichlorophenol	%	94			30-130	Pass	
2.4-Dimethylphenol	%	93			30-130	Pass	
2.4.5-Trichlorophenol	%	93			30-130	Pass	
2.4.6-Trichlorophenol	%	95			30-130	Pass	
Phenol	%	101			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Methylphenol (o-Cresol)	%	98			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	108			30-130	Pass	
2-Chlorophenol	%	100			30-130	Pass	
2-Nitrophenol	%	84			30-130	Pass	
4-Chloro-3-methylphenol	%	91			30-130	Pass	
Pentachlorophenol	%	71			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	103			70-130	Pass	
Cadmium	%	110			70-130	Pass	
Chromium	%	107			70-130	Pass	
Copper	%	109			70-130	Pass	
Lead	%	111			70-130	Pass	
Mercury	%	116			70-130	Pass	
Nickel	%	109			70-130	Pass	
Zinc	%	86			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Fe17771	NCP	%	71			70-130	Pass	
TRH C10-C14	S15-Fe19103	NCP	%	112			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Fe17771	NCP	%	89			70-130	Pass	
Toluene	S15-Fe17771	NCP	%	86			70-130	Pass	
Ethylbenzene	S15-Fe17771	NCP	%	84			70-130	Pass	
m&p-Xylenes	S15-Fe17771	NCP	%	83			70-130	Pass	
o-Xylene	S15-Fe17771	NCP	%	84			70-130	Pass	
Xylenes - Total	S15-Fe17771	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Fe17771	NCP	%	93			70-130	Pass	
TRH C6-C10	S15-Fe17771	NCP	%	80			70-130	Pass	
TRH >C10-C16	S15-Fe19103	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-Fe17148	NCP	%	104			70-130	Pass	
Acenaphthylene	S15-Fe17148	NCP	%	102			70-130	Pass	
Anthracene	S15-Fe17148	NCP	%	111			70-130	Pass	
Benz(a)anthracene	S15-Fe17148	NCP	%	105			70-130	Pass	
Benzo(a)pyrene	S15-Fe17148	NCP	%	107			70-130	Pass	
Benzo(b&j)fluoranthene	S15-Fe17148	NCP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	S15-Fe17148	NCP	%	113			70-130	Pass	
Benzo(k)fluoranthene	S15-Fe17148	NCP	%	98			70-130	Pass	
Chrysene	S15-Fe17148	NCP	%	100			70-130	Pass	
Dibenz(a.h)anthracene	S15-Fe17148	NCP	%	120			70-130	Pass	
Fluoranthene	S15-Fe17148	NCP	%	111			70-130	Pass	
Fluorene	S15-Fe17148	NCP	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe17148	NCP	%	116			70-130	Pass	
Naphthalene	S15-Fe17148	NCP	%	105			70-130	Pass	
Phenanthrene	S15-Fe17148	NCP	%	98			70-130	Pass	
Pyrene	S15-Fe17148	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chlordanes - Total	S15-Fe19051	NCP	%	106			70-130	Pass	
4.4'-DDD	S15-Fe19051	NCP	%	98			70-130	Pass	
4.4'-DDT	S15-Fe19051	NCP	%	90			70-130	Pass	
a-BHC	S15-Fe19051	NCP	%	108			70-130	Pass	
Aldrin	S15-Fe19051	NCP	%	103			70-130	Pass	
b-BHC	S15-Fe19051	NCP	%	112			70-130	Pass	
d-BHC	S15-Fe19051	NCP	%	95			70-130	Pass	
Dieldrin	S15-Fe19051	NCP	%	102			70-130	Pass	
Endosulfan I	S15-Fe19051	NCP	%	97			70-130	Pass	
Endosulfan II	S15-Fe19051	NCP	%	104			70-130	Pass	
Endosulfan sulphate	S15-Fe19051	NCP	%	109			70-130	Pass	
Endrin	S15-Fe19051	NCP	%	108			70-130	Pass	
Endrin aldehyde	S15-Fe19051	NCP	%	99			70-130	Pass	
Endrin ketone	S15-Fe19051	NCP	%	126			70-130	Pass	
g-BHC (Lindane)	S15-Fe19051	NCP	%	109			70-130	Pass	
Heptachlor	S15-Fe19051	NCP	%	109			70-130	Pass	
Heptachlor epoxide	S15-Fe19051	NCP	%	104			70-130	Pass	
Methoxychlor	S15-Fe19051	NCP	%	116			70-130	Pass	
Toxaphene	S15-Fe15616	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S15-Fe19051	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S15-Fe17148	NCP	%	95			30-130	Pass	
2.4-Dimethylphenol	S15-Fe17148	NCP	%	98			30-130	Pass	
2.4.5-Trichlorophenol	S15-Fe17148	NCP	%	88			30-130	Pass	
2.4.6-Trichlorophenol	S15-Fe17148	NCP	%	93			30-130	Pass	
Phenol	S15-Fe17148	NCP	%	110			30-130	Pass	
2-Methylphenol (o-Cresol)	S15-Fe17148	NCP	%	99			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Fe17148	NCP	%	106			30-130	Pass	
2-Chlorophenol	S15-Fe17148	NCP	%	102			30-130	Pass	
2-Nitrophenol	S15-Fe17148	NCP	%	70			30-130	Pass	
4-Chloro-3-methylphenol	S15-Fe17148	NCP	%	88			30-130	Pass	
Pentachlorophenol	S15-Ma00566	NCP	%	125			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Fe20640	NCP	%	84			70-130	Pass	
Cadmium	S15-Fe20640	NCP	%	81			70-130	Pass	
Chromium	S15-Fe20640	NCP	%	85			70-130	Pass	
Lead	S15-Fe20640	NCP	%	107			70-130	Pass	
Mercury	S15-Fe20640	NCP	%	83			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B15-Fe17766	NCP	mg/kg	< 20		<1	30%	Pass	
TRH C10-C14	S15-Fe18880	NCP	mg/kg	720	690	4.0	30%	Pass	
TRH C15-C28	S15-Fe18880	NCP	mg/kg	4600	4500	4.0	30%	Pass	
TRH C29-C36	S15-Fe18880	NCP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B15-Fe17766	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B15-Fe17766	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B15-Fe17766	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B15-Fe17766	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B15-Fe17766	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	B15-Fe17766	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B15-Fe17766	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B15-Fe17766	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	B15-Fe17766	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S15-Fe18880	NCP	mg/kg	1800	1800	4.0	30%	Pass	
TRH >C16-C34	S15-Fe18880	NCP	mg/kg	2100	2100	4.0	30%	Pass	
TRH >C34-C40	S15-Fe18880	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-Fe19050	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-Fe19050	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-Fe19050	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-Fe19050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S15-Fe19050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.6-Trichlorophenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Fe17157	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2-Chlorophenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Nitrophenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S15-Fe17157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pentachlorophenol	S15-Fe17157	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B15-Fe17766	NCP	mg/kg	20	17	17	30%	Pass	
Cadmium	B15-Fe17766	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B15-Fe17766	NCP	mg/kg	11	12	13	30%	Pass	
Copper	B15-Fe17766	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	B15-Fe17766	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	B15-Fe17766	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	B15-Fe17766	NCP	mg/kg	< 5	5.2	6.0	30%	Pass	
Zinc	S15-Fe20175	NCP	mg/kg	rpt 44	rpt 66	rpt	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-Fe13513	NCP	%	9.4	12	20	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: CHATSWOOD
Project ID: 84722

Order No.:
Report #: 448554
Phone: 02 9809 0666
Fax:

Received: Feb 24, 2015 2:10 PM
Due: Mar 3, 2015
Priority: 5 Day
Contact Name: Peter Oitmaa

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8	BTEX	Polychlorinated Biphenyls (PCB)	Speciated Phenols	Total Recoverable Hydrocarbons	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
TS2B	Not Provided		Soil	S15-Fe18353	X	X	X	X	X	X	X	X

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Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Douglas Partners (Syd)**
Contact name:	Peter Oitmaa
Project name:	CHATSWOOD
Project ID:	84722
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 24, 2015 2:10 PM
Eurofins | mgt reference:	**448554**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Peter Oitmaa - peter.oitmaa@douglaspartners.com.au.

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY

Project Name: Chatswood
Project No: 84722 Sampler: AL
Project Mgr: Peter Oitmaa Mob. Phone: 0412 574 518
Email: peter.oitmaa@douglaspartners.com.au
Date Required: Std Lab Quote No.

To: Envirolab Services
12 Ashley Street, Chatswood NSW 2067
Attn: Tania Notaras
Phone: 02 9910 6200 Fax: 02 9910 6201
Email: tnotaras@envirolabservices.com.au

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type S - soil W - water	Container type	Analytes: 8 Heavy metals	TRH BTEX	PAH	OCP/PCB	Phenol	Asbestos			Notes
BH1A	0.4-0.5	1	19/2	S	Jar/Bag									
BH2A	0.02-01	2												
BH3	0.1-02	3												
BH4	0.15-0.3	4												
BH5	0.9-1.0	5			Jar									
BH6	0.3-0.45	6			Jar/bag									
BH7	0.4-0.5	7												
TS 2A	-	8			Jar									
TS 2B	-													Send to Eurofins
Blank	-	9												
Spike	-	10												
R1	-	11		W	Bottles	✓	✓	✓						

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 124021
Date Received: 23.02.15
Time Received: 18:00
Received by: D.F.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Lab Report No.
Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114 Phone: (02) 9809 0666 Fax: (02) 9809 4095

Relinquished by: Signed: Date & Time: Received By: Daniel Ford, ELS Date & Time: 23.02.15 / 18:00

Relinquished by: JYH (ELS) Signed: Date & Time: 24/2/15 11:30 Received By: Date & Time:

Rec'd @ Eurofins 14:10pm 24/02/15 5°C.

Appendix H

QA/QC Information

Quality Assurance/Quality Control Procedures and Results

Field QA/QC for Soil Samples

The field QA/QC procedures for sampling described in the Douglas Partners *Field Procedures Manual* were followed at all times during the field work.

Laboratory-prepared Trip Blank and Trip Spike samples were taken to site during the field work, stored in the same container used to store the field samples, and transported to the laboratory with the field samples selected for analysis. The purpose of the Trip Blank was to determine whether cross-contamination of the samples was likely to have occurred. The purpose of the Trip Spike was to determine whether the significant loss of volatile contaminants may have occurred.

The results for the Trip Blank and Trip Spike samples are provided in Table H1.

Table H1: Trip Blank and Trip Spike QA/QC Results for Hydrocarbons

Sample ID	Total Concentration or % Recovery			
	Benzene	Toluene	Ethyl-benzene	Xylene
Soil Matrix (mg/kg)				
Blank	97%	98%	96%	96%
Spike	<0.2	<0.5	<1	<3

The concentrations of analytes in the Trip Blank were below the laboratory detection limits which indicates that cross-contamination is unlikely to have occurred. The recovery rates for the Trip Spike analytes were within an acceptable range which indicates that the significant loss of volatile contaminants is unlikely to have occurred. The field sampling protocols are therefore considered appropriate.

One rinsate sample (R1) was collected by washing demineralised water over the decontaminated sampling equipment and collecting the rinsate for analysis. The purpose of the rinsate analysis was to determine whether decontamination procedures were adequate.

Selected results for the rinsate analysis are provided in Tables H2 and H3.

Table H2: Rinsate QA/QC Results for Hydrocarbons in Water

Sample ID	Total Concentration (µg/L)				
	Benzene	Toluene	Ethylbenzene	Xylene	F1
R1	<1	<1	<1	<3	<10

Notes: F1 = (C_6-C_{10}) – BTEX

Table H3: Rinsate QA/QC Results for Heavy Metals in Water

Sample ID	Total Concentration (µg/L)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
R1	<50	<10	<10	<10	<30	<0.5	<20	<20

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

The concentrations of all analytes in the rinsate sample were below the laboratory detection limits which indicates appropriate decontamination was undertaken during sampling. The field sampling protocols are therefore considered appropriate.

Intra-Laboratory QA/QC Analysis on Soil Samples

Intra-laboratory analysis of soil samples was conducted as an internal check of the reproducibility of the results from the primary laboratory and as a measure of consistency of sampling techniques. The 'A' sample of the triplicate QA/QC sample was analysed by the primary laboratory (Envirolab). The results were compared between the primary and 'A' samples to determine the relative percentage difference (RPD) between the samples. The RPD was then used to determine whether unacceptable errors may be present in the sample data.

Selected comparative results of the analysis of the intra-laboratory soil samples are summarised in Tables H4 to H6.

Table H4: Intra-Laboratory QA/QC Results for BTEX in Soil

Sample ID	Total Concentration (mg/kg)				
	Benzene	Toluene	Ethylbenzene	m + p xylene	o xylene
BH7/0.4-0.5	<0.2	<0.5	<1	<2	<1
TS2A	<0.2	<0.5	<1	<2	<1
RPD	0%	0%	0%	0%	0%

Table H5: Intra-Laboratory QA/QC Results for TRH in Soil

Sample ID	Total Concentration (mg/kg)			
	$C_6 - C_9$	$C_{10} - C_{14}$	$C_{15} - C_{28}$	$C_{29} - C_{36}$
BH7/0.4-0.5	<25	<50	<100	<100
TS2A	<25	<50	<100	<100
RPD	0%	0%	0%	0%

Table H6: Intra-Laboratory QA/QC Results for Heavy Metals in Soil

Sample ID	Total Concentration (mg/kg)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
BH7/0.4-0.5	7	0.7	32	26	110	0.1	5	89
TS2A	7	0.4	30	7	49	<0.1	3	29
RPD	0%	55%	6%	115%	77%	0%	50%	102%

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

A RPD of ± 30% is generally considered acceptable for inorganic analytes and a wider range may be acceptable for organic analytes. The RPD values outside the generally acceptable range of ± 30% are indicated by yellow shading in Table H6. These values are not considered significant due to the heterogeneous nature of the filling materials from which the sample was obtained.

It is therefore considered that the results indicate acceptable consistency between the primary and 'A' soil samples, that suitable field sampling methodology was adopted and that adequate laboratory precision was achieved.

Inter-Laboratory QA/QC Analysis on Soil Samples

Inter-laboratory analysis of soil samples was conducted as an internal check of the consistency of sampling techniques. The 'B' sample of the triplicate QA/QC sample was analysed by a secondary laboratory (Eurofins). The results were compared between the primary and 'B' samples to determine the relative percentage difference (RPD) between the samples. The RPD was then used to determine whether unacceptable errors may be present in the sample data.

Selected comparative results of the analysis of the inter-laboratory soil samples are summarised in Tables H7 to H9.

Table H7: Inter-Laboratory QA/QC Results for BTEX in Soil

Sample ID	Total Concentration (mg/kg)				
	Benzene	Toluene	Ethylbenzene	m + p xylene	o xylene
BH7/0.4-0.5	<0.2	<0.5	<1	<2	<1
TS2B	<0.1	<0.1	<0.1	<0.2	<0.1
RPD	0%	0%	0%	0%	0%

Table H8: Inter-Laboratory QA/QC Results for TRH in Soil

Sample ID	Total Concentration (mg/kg)			
	$C_6 - C_9$	$C_{10} - C_{14}$	$C_{15} - C_{28}$	$C_{29} - C_{36}$
BH7/0.4-0.5	<25	<50	<100	<100
TS2B	<20	<50	<100	<100
RPD	0%	0%	0%	0%

Table H9: Inter-Laboratory QA/QC Results for Heavy Metals in Soil

Sample ID	Total Concentration (mg/kg)							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
BH7/0.4-0.5	7	0.7	32	26	110	0.1	5	89
TS2B	7.1	0.5	35	23	130	0.09	<5	73
RPD	0%	33%	9%	12%	17%	0%	0%	20%

Notes: As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Pb = Lead, Hg = Mercury; Ni = Nickel; Zn = Zinc

A RPD of ± 30% is generally considered acceptable for inorganic analytes and a wider range may be acceptable for organic analytes. The RPD value outside the generally acceptable range of ± 30% is indicated by yellow shading in Table H9. This value is not considered significant due to the heterogeneous nature of the filling materials from which the sample was obtained.

It is therefore considered that the results indicate acceptable consistency between the primary and 'B' soil samples, that suitable field sampling methodology was adopted and that adequate laboratory precision was achieved.

Laboratory QA/QC Procedures

Quality control procedures used during the analyses include:

Reagent Blank

A reagent blank sample is prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. The laboratory results for reagent blanks indicated that concentrations of all analytes were below respective laboratory practical quantitation limits.

Duplicate

This is the complete duplicate of a sample from the process batch. The results of the two samples are compared to laboratory acceptance criteria and exceedances highlighted. No exceedances were detected.

Matrix Spike

A portion of a sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and determine whether matrix interference exists. The matrix spike recovery is compared to laboratory acceptance criteria. No exceedances were noted.

Laboratory Control Sample

This is a standard reference sample or control matrix used to check the analytical process. The results were within acceptable limits.

Surrogate Spike

Surrogates are known additions of known compounds to each sample, blank, matrix spike and laboratory control sample. The surrogates are similar to the analyte of interest, however are not expected to be detected in real samples. The results were acceptable.