ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

BUNNINGS GROUP LIMITED

ON

STAGE 1 ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED WAREHOUSE DEVELOPMENT

AT

LOTS 33 AND 34 IN DP243029 CORNER OF SAPPHIRE COAST DRIVE AND TURA BEACH DRIVE, TURA BEACH, NSW

25 SEPTEMBER 2015 **REF: E28682KBrpt**

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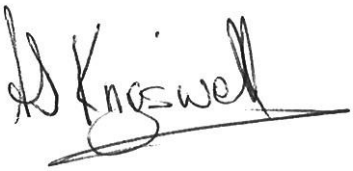

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ABBREVIATIONS

Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene	**BTEXN**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Chain of Custody	**COC**
Contaminant of Primary Concern	**CoPC**
Conceptual Site Model	**CSM**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Ecological Assessment Criteria	**EAC**
Ecological Investigation Levels	**EILs**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environmental Protection Agency	**EPA**
Environmental Site Assessment	**ESA**
Fibre Cement Fragments	**FCF**
General Approvals of Immobilisation	**GAI**
General Solid Waste	**GSW**
Health Investigation Level	**HILs**
Hardness Modified Trigger Values	**HMTV**
Health Screening Level	**HSLs**
International Organisation of Standardisation	**ISO**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Local Government Authority	**LGA**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Photo-ionisation Detector	**PID**
Practical Quantitation Limit	**PQL**
Preliminary Site Investigation	**PSI**
Quality Assurance	**QA**

ABBREVIATIONS

Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Restricted Solid Waste	**RSW**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Site Audit Statement	**SAS**
Site Audit Report	**SAR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standard Sampling Procedure	**SSP**
Standard Water Level	**SWL**
Standard Sampling Procedure	**SSP**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
Volatile Organic Chlorinated Compound	**VOCC**
Workplace, Health and Safety	**WHS**

EXECUTIVE SUMMARY

Bunnings Group Limited ('the client') commissioned Environmental Investigation Services (EIS) to undertake a Stage 1 Environmental Site Assessment (ESA) for the proposed warehouse development at Lots 33 and 34 in DP243029, corner of Sapphire Coast Drive and Tura Beach Drive, Tura Beach, NSW.

The site location is shown on Figure 1 and the assessment was confined to the proposed development area as shown on Figure 2 attached in the appendices. The proposed development area is referred to as 'the site' in this report.

The scope of work for the ESA included the following: review of site information including background and site history information; identify Areas of Environmental Concern (AEC); preparation of a Preliminary Conceptual Site Model (PCSM); design and implementation of a sampling, analysis and quality plan (SAQP); interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); Data Quality Assessment (DQA); and Tier 1 Risk Assessment and review of PCSM.

A review of the site history information has indicated the following:

- The aerial photographs indicate that the site was part of a wider bushland until 1971. The site was subsequently cleared of vegetation and remained vacant between 1980s and present;
- The land title records indicate that the site was owned by private citizens between 1885 and 1970. The site was subsequently owned by companies including A. V. Jennings Limited between 1970 to the present date;
- WorkCover records did not indicate any licenses to store dangerous goods at the site; and
- NSW EPA records did not indicate any notices for the site.

The PCSM identified the following AEC at the site:

- Fill Material (Entire Site): The boreholes drilled for the JK investigation encountered relatively shallow fill across the site ranging in depth from approximately 0.2m to 0.4m. The fill may have been imported from various sources and can contain elevated concentrations of contaminants.
- Use of Pesticides (Entire Site): The site has been cleared of bushland and has been vacant since at least 1980s. Pesticides could have been used for weed and pest control during this period.

Soil samples for this investigation were obtained from 8 sampling points in the proposed development area as shown on the attached Figure 2. This density is approximately 27% of the minimum sampling density recommended by the EPA. Sampling was not undertaken in Lot 34 of the wider site for the Stage 1 ESA. This lot has been excluded from the investigation.

Selected soil samples were analysed for a range of CoPC as outlined in the SAQP. The results of the laboratory testing were compared to the SAC outlined in Section 6. The assessment identified the following:

- Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation; and
- All results were below the SAC adopted for this assessment.

Based on the scope of work undertaken, EIS are of the opinion that the AEC identified in the PCSM pose relatively low risk to the site receptors. The site is considered to be suitable for the proposed commercial development.

Additional waste classification including TCLP testing should be undertaken based on the final design for the proposed development.

In the event unexpected conditions are encountered during development work or between sampling locations that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

1 INTRODUCTION

Bunnings Group Limited ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake a Stage 1 Environmental Site Assessment (ESA) for the proposed warehouse development at Lots 33 and 34 in DP243029, corner of Sapphire Coast Drive and Tura Beach Drive, Tura Beach, NSW.

The site location is shown on Figure 1 and the assessment was confined to the proposed development area as shown on Figure 2 attached in the appendices. The proposed development area is referred to as 'the site' in this report.

A geotechnical investigation was undertaken in conjunction with this assessment by JK Geotechnics[2]. The results of the investigation are presented in a separate report (Ref. 28682SYrpt, dated 25 September 2015[3]). This report should be read in conjunction with the JK report.

1.1 Proposed Development Details

Based on the supplied concept plans prepared by Bunnings Group Limited we understand that the proposed development will include:

- Construction of a warehouse and associated nursery, bagged goods and timber trade over the southern portion of the site;
- On grade car parking will be located over the northern portion of the site with entry to the site via Tura Beach Road; and
- Cut and fill is expected to be required to form a level building platform although the total cut and fill heights are unknown.

1.2 Objectives

The objectives of the study include:

- Assess the potential for site contamination;
- Assess the potential risk the contamination may pose to the site receptors;
- Provide a preliminary waste classification for the off-site disposal of soil; and
- Comment on the suitability of the site for the proposed development/landuse.

1.3 Scope of Work

The study was undertaken generally in accordance with an EIS proposal (Ref: EP9191KB) of 22 July 2015 and acceptance from the client of 18 August 2015.

The scope of work included the following:

- Review of site information including background and site history information;

[1] Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

[2] Geotechnical consulting division of J&K

[3] Referred to as JK 2015 Report

- Identify Areas of Environmental Concern (AEC);
- Preparation of a Preliminary Conceptual Site Model (PCSM);
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment (DQA);
- Undertake a Tier 1 Risk Assessment and review of CSM; and
- Preparation of a report presenting the results of the assessment.

The report was prepared with reference to regulations and guidelines outlined in the table below. Individual guidelines are also referenced within the text of the report.

Table 1-1: Guidelines and Regulations

Guidelines and Regulations
NSW Government Legislation (1997), *Contaminated Land Management Act 1997* [4]
NSW Government (1998), *State Environmental Planning Policy No. 55 – Remediation of Land* [5]
NSW Office of Environment and Heritage (OEH) (now EPA) (2011), *Guidelines for Consultants Reporting on Contaminated Sites* [6]
NSW EPA (1995), *Sampling Design Guidelines* [7]
NSW Department of Environment and Conservation (DEC) (now EPA) (2006), *Guidelines for the NSW Site Auditor Scheme (2nd edition)* [8]
NSW EPA (2015), *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* [9]
National Environment Protection Council (NEPC) (2013), *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)* [10]

[4] referred to as CLM Act

[5] referred to as SEPP55

[6] referred to as Reporting Guidelines

[7] referred to as Sampling Design Guidelines

[8] referred to as Site Auditor Guidelines

[9] referred to as the Duty to Report Guidelines

[10] referred to as NEPM 2013

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Current Site Owner:	Ingow Pty Limited
Site Address:	2B Tura Beach Drive, Tura Beach, NSW (Lot 33) 296 Sapphire Coast Drive, Tura Beach, NSW (Lot 34)
Lot & Deposited Plan:	Lots 33 and 34 in DP243029
Current Land Use:	Vacant/Rural land
Proposed Land Use:	Commercial/Retail
Local Government Authority (LGA):	Bega Valley Council
Current Zoning:	Zone 1(c) Rural Small Holdings Zone
Site Area/Area of Proposed Development (hectares):	Total site area – 4 hectares Proposal development area – 2 hectares
RL (AHD in m) (approx.):	115m to 123m
Geographical Location (MGA) (approx.):	N: 5915815 E: 224684
Site Plans:	See Appendices

2.2 Site Location and Regional Setting

The site is located in a predominantly residential/rural area of Tura Beach as shown on Figure 1. The site is bounded by Tura Beach Drive to the east, by Sapphire Coast Drive to the north, by residential/rural area to the south and west. Tura Beach Shopping Village was located further to the east of the site beyond Tura Beach Drive.

2.3 Topography

The subject site is located in an undulating topography that generally falls towards the southeast and the coast at approximately 4° to 5°.

2.4 Site Inspection

A walkover inspection of the site was undertaken by JK on 26 August 2015. The inspection was limited to accessible areas of the site and immediate surrounds.

At the time of the inspection, the site was vacant and generally covered by tall grass and ferns, with clusters of large trees ranging from approximately 20m to 30m in height in the north, west and north-west. Gravelly sand surface soils were exposed near the intersection of Tura Beach Drive and Sapphire Coast Drive. The west section of the site was more densely vegetated with large trees, ferns and scrub.

The site currently drains by infiltration, with two stormwater pits noted along the southern site boundary behind the retaining wall of the neighbouring site. The investigation was undertaken soon after a high rainfall event. Ponding water was observed at the intersection of Tura Beach Drive and Sapphire Coast Drive. Perched groundwater was encountered in boreholes BH2, BH3 and BH7, and was noted to possibly correspond with the particular grass type growing in the vicinity of those boreholes which may signify areas of perched or shallow groundwater.

Beyond Sapphire Coast Drive to the north was an area of dense bush with tall trees and scrub while on the other side of Tura Beach Drive, to the east was Tura Beach Shopping Village. The shopping village was single storey and appeared to have been filled over the southern end to achieve the final levels.

A nursing home was located to the south of the site. The neighbouring lot to the rear was undeveloped and on the same level with the subject site.

2.5 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the study. Major services which could pose a potential migratory pathway were not identified at the site.

2.6 Regional Geology

A review of the 1:100,000 Geological Map of Bega indicates the site to be underlain by sandstone and conglomerate of the Merimbula Group. The presence of the sandstone and/or conglomerate was confirmed by the boreholes drilled by JK, which encountered a subsurface profile generally comprising fill over natural sands and clays that in turn overlay weathered sandstone. Further details are provided in Section 7.1.

2.7 Acid Sulfate Soil (ASS) Risk

The site is not located in an ASS risk area.

2.8 Hydrogeology

A review of groundwater bore records available on the NSW Government Water Information[11] online database was undertaken on 24 September 2015. The search was limited to registered bores located within a radius of approximately 500m of the site.

The search indicated three (3) registered bores within the search area. A review of the information sheets indicate that the bores are registered for monitoring purposes. These bores are not registered for beneficial use and hence not considered to be potential receptors. Copies of the records are attached in the appendices.

A review of the regional geology and groundwater bore information indicates that the subsurface condition at the site is expected to consist of residual soils overlying relatively shallow bedrock. The occurrence of groundwater that could be utilised as a resource for beneficial use is considered to be relatively low under such conditions. A perched aquifer in the subsurface may be present.

2.9 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is a swamp and a creek/gully located approximately 450m to the south-east of the site. This is not considered to be a potential receptor.

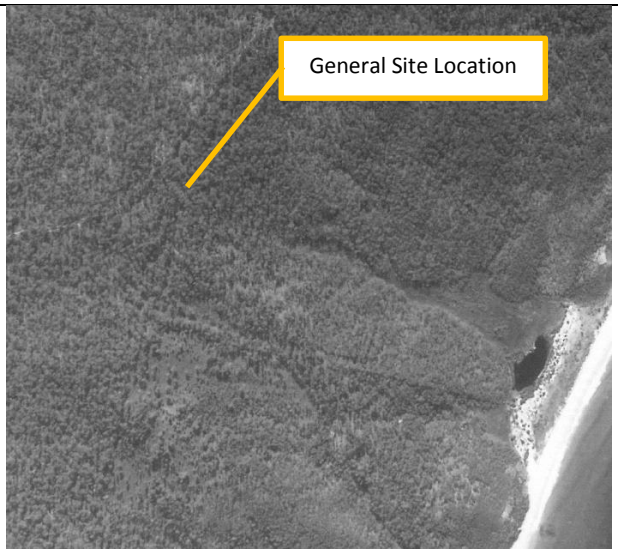
[11] http://www.waterinfo.nsw.gov.au/gw/

3 SITE HISTORY INFORMATION

3.1 Review of Historical Aerial Photographs

Historical aerial photographs available at the NSW Department of Lands were reviewed for the study. A summary of the relevant information is presented in the following table:

Table 3-1: Summary of Historical Aerial Photos

Year	Details
1957	 The site formed part of wider bushland which generally extended from the coast.
1962	The site appeared generally similar to the 1957 photograph. Some clearing of vegetation had occurred in the generally vicinity of the site.
1971	Large sections of bushland in the vicinity of the site had been cleared. Dirt tracks were visible in the immediate vicinity of the site.
1989	The site was generally vacant and formed part of a wider vacant property which extended to the south, east and west. Scattered trees and bushes were located at the site. Sapphire Coast Drive and Tura Beach Drive had been developed. The area further to the east of the site had been developed and occupied by residences. A large pond/dam was located on a property to the west of the site.
1994	The site and immediate surrounds appeared similar to the 1989 photograph.
2003	The site generally appeared similar to the present layout. Development was underway to the south-east of the site.

Year	Details
2014 [12] (SIX Maps)	 The site generally appeared similar to the present layout. The shopping village development was to the east of the site.

3.2 Review of Land Title Records

Land title records were reviewed for the study. The record search was undertaken by Advance Legal Searchers Pty Ltd. Copies of the title records are attached in the appendices.

The title records indicate the following:

- The site was owned by private citizens between 1885 and 1970;
- The site was owned by Hawkshead Pty Ltd between 1970 and 1973;
- The site was owned by private citizens between 1973 and 1998;
- Lot 33 was owned by Jennings Industries Limited and A. V. Jennings Limited between 1976 to 1996;
- Lot 34 was owned by Mulnot Pty Limited between 1998 and 2003; and
- Ingow Pty Limited has owned the site since 2003.

3.3 Review of Bega Valley Council Information

3.3.1 Publically Accessible Information

A search of council records is currently underway. The results will be summarised in a separate letter when received.

3.3.2 Section 149 Planning Certificate

The s149 (2 and 5) planning certificates were reviewed for the study. The search was limited to Lots 33 and 34. Copies of the certificates are attached in the appendices.

[12] http://maps.six.nsw.gov.au/

A summary of the relevant information is outlined below:

a) The land is not located in an area of ecological significance;

b) The land is not deemed to be:
   - significantly contaminated;
   - subject to a management order;
   - subject of an approved voluntary management proposal; or
   - subject to an on-going management order under the provisions of the CLM Act 1997;

c) The land is not subject to a Site Audit Statement (SAS);

d) The land is not located within an ASS risk area; and

e) The land is not located in a heritage conservation area.

3.4 WorkCover Records

WorkCover records were reviewed for the study. Copies of relevant documents are attached in the appendices.

The search did not identify any licences to store dangerous goods including underground fuel storage tanks (USTs) or above ground storage tanks (ASTs) at the site.

3.5 NSW EPA Records

The NSW EPA records available online were reviewed for the study on 24 September 2015. A summary of the relevant information is provided in the following table:

Table 3-2: Summary of NSW EPA Online Records

Source	Details
CLM Act 1997[13]	There were no notices for the site under Section 58 of the Act.
NSW EPA List of Contaminated Sites[14]	The site is not listed on the NSW EPA register.
POEO Register[15]	There were no notices for the site on the POEO register. A number of licenses were noted for a Plant owned by Bega Valley Shire Council located on Tura Beach Drive.

[13] http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx

[14] http://www.epa.nsw.gov.au/clm/publiclist.htm

[15] http://www.epa.nsw.gov.au/prpoeoapp/

3.6 Summary of Site History Information

A review of the site history information has indicated the following:

- The aerial photographs indicate that the site was part of a wider bushland until 1971. The site was subsequently cleared of vegetation and remained vacant between 1980s and present;
- The land title records indicate that the site was owned by private citizens between 1885 and 1970. The site was subsequently owned by companies including A. V. Jennings Limited between 1970 to the present date;
- WorkCover records did not indicate any licenses to store dangerous goods at the site; and
- NSW EPA records did not indicate any notices for the site.

3.7 Integrity of Site History Information

The majority of the site history information has been obtained from government organisations as outlined above. The veracity of the information from these sources is considered to be relatively high.

A certain degree of information loss can be expected given the age of the development; gap between aerial photographs; and lack of detailed information prior to the 1900's.

4 PRELIMINARY CONCEPTUAL SITE MODEL (PCSM)

The CSM is based on a review of the site information outlined previously in this report. The Areas of Environmental Concern (AEC) identified in the CSM can either be a point source of contamination or widespread area/s impacted by current or historical activities. The CSM should be reviewed and updated when more information becomes available for the site.

Table 4-1: CSM

AEC / Extent	CoPC	Potential Exposure Pathway and Media	Potential Receptors
Fill Material – Entire Site The boreholes drilled for the JK investigation encountered relatively shallow fill across the site ranging in depth from approximately 0.2m to 0.4m. The fill may have been imported from various sources and can contain elevated concentrations of contaminants.	Heavy metals, TRH, BTEXN, PAHs, OCPs, OPPs, PCB, and asbestos	Direct Contact – dermal contact; ingestion; and inhalation of dust, vapours and fibres. Media - soil, groundwater and vapour.	Human Receptors – Site occupants; visitors; development and maintenance workers; and off-site occupants. Environmental Receptors – Flora and fauna at the site and immediate surrounds; and receiving water bodies.
Use of Pesticides – Entire Site The site has been cleared of bushland and has been vacant since at least 1980s. Pesticides could have been used for weed and pest control during this period.	Heavy metals, OCPs, and OPPs	Direct Contact – dermal contact; ingestion; and inhalation of dust. Media – soil and groundwater.	Human Receptors – As Above Environmental Receptors – As Above

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Data Quality Objectives (DQO)

The NEPM 2013 defines the DQO process as a seven step iterative planning tool used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of the site.

The DQO process is detailed in the US EPA document *Guidance on systematic planning using the data quality process (2006[16])* and the NSW DEC document *The Guidelines for the NSW Site Auditor Scheme, 2nd Edition (2006[17])*.

These seven steps are applicable to this assessment as summarised in the table below:

Table 5-1: DQOs – Seven Steps

Step	Input
State the Problem	The CSM has identified AEC at the site which may pose a risk to the site receptors. An intrusive investigation is required to assess the risk and comment on the suitability of the site for the proposed development or intended landuse. The assessment also aims to meet the requirements of SEPP55 in order to address the council Development Application (DA) process. The EIS project team will include: project principal (PP) and/or project associate (PA); project engineer/scientist (PE); and field engineer/scientist (FE) as outlined in the quality recorded checklist maintained for the project in accordance with our ISO 9001 certification.
Identify the Decisions/ Goal of the Study	The data collection is project specific and has been designed based on the following: • Review of site information; • Review of the CSM; • Development of Site Assessment Criteria (SAC) for each media; and • Data interpretation based on the following decision statements: 1) No single value exceeds 250% of the SAC; 2) Statistical analysis will be used to assess the laboratory data against the SAC when there are results above the SAC. The following criteria will be adopted: ➢ The 95% Upper Confidence Limit (UCL) value of the arithmetic mean concentration of each contaminant should be less than the SAC; and ➢ The standard deviation (SD) of the results must be less than 50% of the SAC. 3) Statistical calculations will not be undertaken if all results are below the SAC; and

[16] US EPA, (2006), *Guidance on Systematic Planning using the Data Quality Objectives Process.* (referred to as US EPA 2006)

[17] NSW DEC, (2006), *Guidelines for the NSW Site Auditor Scheme, 2nd ed.* (referred to as Site Auditor Guidelines 2006)

Step	Input
	4) Statistical calculations will not be undertaken on the following: ➢ Health Screening Levels (HSLs) – elevated point source contamination associated with petroleum hydrocarbons can pose a vapour risk to receptors.
Identify Information Inputs	The following information will be collected: • Soil samples based on subsurface conditions; • Potential Asbestos Containing Material (ACM) encountered during the inspection; • The SAC will be designed based on the criteria outlined in NEPM 2013. Other criteria will be used as required and detailed in this report; • The samples will be analysed in accordance with the analytical methods outlined in NEPM 2013; • Field screening information (i.e. PID data, presence of hydrocarbons etc.) and observations made during the field investigation will be taken into consideration in selecting the analytical schedule; and • Any additional information that may arise during the field work will also be used as data inputs.
Define the Study Boundary	The sampling will be confined to the proposed development area of the site as shown in Figure 2. Fill has been identified as an AEC. The source of fill has not been established. Fill is considered to be heterogeneous material with PCC occurring in random pockets or layers. The presence of PCC in between sampling points cannot be measured. The areas excluded from the investigation are outlined in the data gaps.
Develop the analytical approach (or decision rule)	The following acceptable limits will be adopted for the data quality assessment: • The following acceptance criteria will be used to assess the RPD results: ➢ results > 10 times the practical quantitation limit (PQL), RPDs < 50% are acceptable; ➢ results between 5 and 10 times PQL, RPDs < 75% are acceptable; ➢ results < 5 times PQL, RPDs < 100% are acceptable; and ➢ An explanation is provided if RPD results are outside the acceptance criteria. • Acceptable concentrations in Trip Spike (TS), Trip Blanks (TB) and Field Rinsate (FR) samples as applicable. Non-compliance to be documented in the report; and • Review of the QA/QC results reported in the laboratory reports. Non-compliance to be documented.
Specify the performance or acceptance criteria	NEPM 2013 defines decision errors as '*incorrect decisions caused by using data which is not representative of site conditions'*. This can arise from errors during sampling or analytical testing. A combination of these errors is referred to as '*total study error*'. The study error can be managed through the correct choice of sample design and measurement. Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false.

Step	Input
	The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. In this case, for example, the PCC identified in the CSM is considered to pose a risk to receptors unless proven not to. The null hypothesis has been adopted for this assessment.
Optimise the design for obtaining data	The most resource-effective design will be used in an optimum manner to achieve the assessment objectives.

5.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this assessment is outlined in the table below:

Table 5-2: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	The NSW EPA Sampling Design Guidelines recommend a sampling density based on the size of the investigation/site area. The guideline provides a minimum number of sampling points required for the investigation on a systematic sampling pattern. The guidelines recommend sampling from a minimum of 30 evenly spaced sampling points for the proposed development area of approximately 2 hectares. Samples for this investigation were obtained from 8 sampling points as shown on the attached Figure 2. This density is approximately 27% of the minimum sampling density recommended by the EPA.
Sampling Plan	The sampling locations were placed on a systematic plan with a grid spacing of approximately 50m between sampling locations. A systematic plan was considered suitable to address potential contaminants associated with the fill material.
Exclusion Areas (Data Gaps)	Sampling was not undertaken in Lot 34 of the wider site for the Stage 1 ESA. This lot has been excluded from the investigation.
Sampling Equipment	Soil samples were obtained on 26 August 2015. Sampling locations were set out using a tape measure. In-situ sampling locations were cleared for underground services by an external contractor prior to sampling. The sample locations were drilled using a hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.

Aspect	Input
Sampling Collection and Field QA/QC	Soil samples were collected from the fill and natural profiles based on field observations. The sampling depths are shown on the logs attached in the appendices. Additional samples were obtained when relatively deep fill (>0.5m) was encountered. Samples were also obtained when there was a distinct change in lithology or based on the observations made during the investigation. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. Samples were placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities. The samples were labelled with the job number, sampling location, sampling depth and date in accordance with the SSP.
Field PID Screening for VOCs	A portable Photoionisation Detector (PID) was used to screen the samples for the presence of VOCs and to assist with selection of samples for hydrocarbon analysis. The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. Some compounds give relatively high readings and some can be undetectable even though present in identical concentrations. The portable PID is best used semi-quantitatively to compare samples contaminated by the same hydrocarbon source. The PID is calibrated before use by measurement of an isobutylene standard gas. All the PID measurements are quoted as parts per million (ppm) isobutylene equivalents. PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. PID data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases.
Decontami-nation and Sample Preservation	Where applicable, the sampling equipment was decontaminated using a scrubbing brush and potable water and Decon 90 solution (phosphate free detergent) followed by rinsing with potable water. Samples were preserved by immediate storage in an insulated sample container with ice or chill packs. On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.3 Analytical Schedule

The analytical schedule is outlined in the following table:

Table 5-3: Analytical Schedule

CoPC	Fill Samples	Natural Soil Samples
Heavy Metals	8	3
TRH/BTEXN	8	3
PAHs	8	3
OCPs/OPPs	8	NA
PCBs	8	NA
Asbestos in Soil	8	NA

5.3.1 Laboratory Analysis

The samples were analysed by the NATA Accredited laboratory/s using the analytical methods detailed in Schedule B(3) of NEPM 2013 and other standards. Reference should be made to the laboratory report/s attached in the appendices for further details.

Table 5-4: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicate and trip blank samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	133414

6 SITE ASSESSMENT CRITERIA (SAC)

The SAC adopted for the assessment is outlined in the table below. The SAC has been derived from the NEPM 2013 and other guidelines as applicable. The guideline values for individual contaminants are presented in the attached report tables.

Table 6-1: SAC Adopted for this Investigation

Guideline	Applicability
Health Investigation Levels (HILs) (NEPM 2013)	The HIL-D criteria for 'commercial/industrial' have been adopted for this assessment.
Health Screening Levels (HSLs) (NEPM 2013)	The HSL-D criteria for 'commercial/industrial' have been adopted for this assessment.
Asbestos	The 'presence/absence' of asbestos in soil has been adopted as the assessment criterion.
Ecological Assessment Criteria (EAC) (NEPM 2013)	A preliminary screening of ecological risk has been undertaken based on the limited information available at this stage. The EAC criteria for 'urban residential and public open space (URPOS)' exposure setting have been adopted. Soil parameters: pH; cation exchange capacity (CEC); and clay content have not been analysed for the assessment. On this basis, the EIL and ESL calculations have taken the 'worst case' scenario in order to generate the EAC. The ABC values for low traffic (25th percentiles) areas for new suburbs of NSW published in Olszowy et. al. (1995[18]) has been adopted for this assessment.
Waste Classification (WC) Criteria	The criteria outlined in the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014[19]) has been adopted to classify the material for off-site disposal.

[18] Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

[19] NSW EPA, (2014), *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

7 INVESTIGATION RESULTS

7.1 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs attached in the appendices for further details.

Table 7-1: Summary of Subsurface Conditions

Profile	Description (m in bgl)
Fill	Silty sand fill/topsoil was encountered at the surface in all boreholes and extended to depths of approximately 0.2m to 0.4m. The fill contained inclusions of quartz gravel, ironstone gravel, ash, and root fibres.
Natural Soil	Natural soil was encountered beneath the fill in all of the boreholes and extended to depths of approximately 1.7m to 7.5m. The natural soil typically comprised of: clayey gravelly sand; silty sand; sandy clay; and clayey sand. The natural soil contained inclusions of quartz gravel, ironstone gravel and ash.
Bedrock	Sandstone bedrock was encountered below the natural soil in boreholes BH1, BH3 to BH8 and extended to the maximum termination depth of the boreholes. The sandstone was fine to coarse grained and extremely to distinctly weathered on first contact.
Groundwater	Groundwater seepage was encountered in boreholes BH2, BH3, BH5 and BH7 during drilling. Standing water level (SWL) was noted in these boreholes at depths of approximately 0.4m to 7.6m a short time on completion of drilling.

7.2 Field Screening

PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. All results were 0 ppm equivalent isobutylene which indicates a lack of PID detectable VOCs.

7.3 Soil Laboratory Results

The soil laboratory results are compared to the relevant SAC in the attached report tables. A summary of the results assessed against the SAC is presented below.

Table 7-2: Summary of Soil Laboratory Results

Analyte	Results Compared to SAC
Heavy Metals	**HILs:** All heavy metal results were below the HIL-D criteria.

Analyte	Results Compared to SAC
	EILs: All heavy metal results were below the EIL-URPOS criteria. **WC:** All heavy metal results were less than the CT1 criteria.
TRH	**HSLs:** All TRH results were below the HSL-D criteria. **ESLs:** All TRH results were below the ESL-URPOS criteria. **WC:** All TRH results were less than the CT1 criteria.
BTEXN	**HSLs:** All BTEXN results were below the HSL-D criteria. **ESLs:** All BTEXN results were below the ESL-URPOS criteria. **WC:** All BTEX results were less than the relevant CT1 criteria.
PAHs	**HILs:** All PAH results were below the HIL-D criteria. **HSLs:** All naphthalene results were below the HSL-D criteria. **ESLs:** All benzo(a)pyrene results were below the ESL-URPOS criteria. **EILs:** All naphthalene results were below the EIL-URPOS criteria. **WC:** All PAH results were less than the CT1 criteria.
OCPs & OPPs	**HILs:** All OCP and OPP results were below the HIL-D criteria. **EILs:** All DDT results were below the EIL-URPOS criteria.

Analyte	Results Compared to SAC
	WC: All OCP and OPP results were less than the CT1 criteria.
PCBs	**HILs:** All PCB results were below the HIL-D criterion. **WC:** All PCB results were less than the CT1 criterion.
Asbestos	Asbestos was not detected in the samples analysed for the investigation.

8 DATA QUALITY ASSESSMENT

As part of the data quality assessment the following data quality indicators (DQIs) were assessed: precision, accuracy, representativeness, completeness and comparability as outlined in the table below. Reference should be made to the appendices for an explanation of the individual DQI.

Table 8-1: Assessment of DQIs

Completeness
Field Considerations: • The investigation was designed as a preliminary screening and sampling was confined to the development footprint on Lot 33 (see Figure 2); • Samples were obtained from various depths based on the subsurface conditions encountered at the sampling locations. All samples were recorded on the borehole logs. All sampling points are shown on the attached Figure 2; • The investigation was undertaken by trained staff in accordance with the SSP; and • Documentation maintained during the field work is attached in the appendices where applicable. Laboratory Considerations: • Selected samples were analysed for a range of CoPC as outlined in the SAQP; • All samples were analysed by NATA registered laboratory/s in accordance with the analytical methods outlined in NEPM 2013; • Appropriate analytical methods and PQLs were used by the laboratory/s; and • Appropriate sample preservation, handling, holding time and COC procedures were adopted for the investigation.
Comparability
Field Considerations: • The investigation was undertaken by trained staff in accordance with the SSP; • The climate conditions encountered during the field work were noted on the site description record maintained in the job file; and • Consistency was maintained during sampling in accordance with the SSP. Laboratory Considerations: • All samples were analysed in accordance with the analytical methods outlined in NEPM 2013; • Appropriate PQLs were used by the laboratory/s for all analysis (other than those outlined above); • All primary, intra-laboratory duplicate/s and other QA/QC samples were analysed by the same laboratory; and • The same units were used by the laboratory/s for all of the analysis.
Representativeness
Field Considerations: • All media identified in the SAQP was sampled.

Laboratory Considerations:

- All samples were analysed in accordance with the SAQP.

Precision

Field Considerations:

- The investigation was undertaken in accordance with the SSP.

Laboratory Considerations:

- Analysis of field QA/QC samples including intra-laboratory duplicate and trip blank (TB) as outlined below;
- The field QA/QC frequency adopted for the investigation is outlined below;
- Calculation of the Relative Percentage Difference (RPD) from the primary and duplicate results (the RPD calculation equation is outlined in the attached appendices);
- Assessment of RPD results against the acceptance criteria outlined in **Section 5.1.**

Intra-laboratory RPD Results:

Soil Samples at a frequency of 9% of the primary samples. Dup 1 is a soil duplicate of primary sample BH2 (0-0.1m). The intra-laboratory results are presented in the attached report tables. The results indicated that field precision was acceptable.

Trip Blank (TB):

One soil trip blank TBS was analysed for BTEX at a frequency of one blank per batch of volatiles. The results are presented in the attached report tables. The results were all less than the PQLs.

Accuracy

Field Considerations:

- The investigation was undertaken in accordance with the SSP.

Laboratory Considerations:

- The analytical quality assessment adopted by the laboratory/s was in accordance with the NATA and NEPM 2013 requirements as outlined in the analytical report/s;
- A review of the report/s indicates the following comments noted by the laboratory/s:

Envirolab Report 133414 – Percentage recovery was not possible in some samples for TRH due to interference from analytes other than those being tested in the sample/s.

9 PRELIMINARY WASTE CLASSIFICATION OF SOIL FOR OFF-SITE DISPOSAL

The waste classification of soil for off-site disposal is summarised in the following table:

Table 9-1: Preliminary Waste Classification

Site Extent / Material Type	Classification	Disposal Option
Fill/topsoil in the investigation area	General Solid Waste (non-putrescible) (GSW)	A NSW EPA landfill licensed to receive the waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation. Alternatively, the fill material is considered to be suitable for re-use on the subject site (only) provided it meets geotechnical and earthwork requirements.
Natural soil and sandstone bedrock in the investigation area	Virgin excavated natural material (VENM)	VENM is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. Alternatively, the natural material can be disposed of as VENM to a facility licensed by the NSW EPA to receive the waste stream.

10 TIER 1 RISK ASSESSMENT AND REVIEW OF PCSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

The assessment identified the following:

- Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation;
- All results were below the SAC adopted for this assessment; and
- EIS consider the risk posed by the AEC to the receptors to be relatively low.

10.1 Data Gaps

The assessment has identified the following data gaps:

- Soil sampling for the ESA was confined to the proposed development area at Lot 33. Sampling has not been undertaken on Lot 34;
- Groundwater at the site has not been investigated; and
- Additional waste classification including TCLP testing should be undertaken based on the final design for the proposed development.

11 CONCLUSION

EIS consider that the report objectives outlined in **Section 1.2** have been addressed.

Based on the scope of work undertaken, EIS are of the opinion that the AEC identified in the PCSM pose relatively low risk to the site receptors. The site is considered to be suitable for the proposed commercial development.

Additional waste classification including TCLP testing should be undertaken based on the final design for the proposed development.

In the event unexpected conditions are encountered during development work or between sampling locations that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

11.1 Regulatory Requirement

The regulatory requirements applicable for the site are outlined in the following table:

Table 11-1: Regulatory Requirement

Guideline	Applicability
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.
Dewatering Consent	In the event groundwater is intercepted during excavation works, dewatering may be required. Council, NSW Office of Water (NOW) and other relevant approvals (from discharge authorities like Sydney Water etc.) should be obtained prior to the commencement of dewatering.

12 LIMITATIONS

The report limitations are outlined below:

- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report;
- EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- EIS have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

IMPORTANT INFORMATION ABOUT THIS REPORT

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data
Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations
Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Report Figures

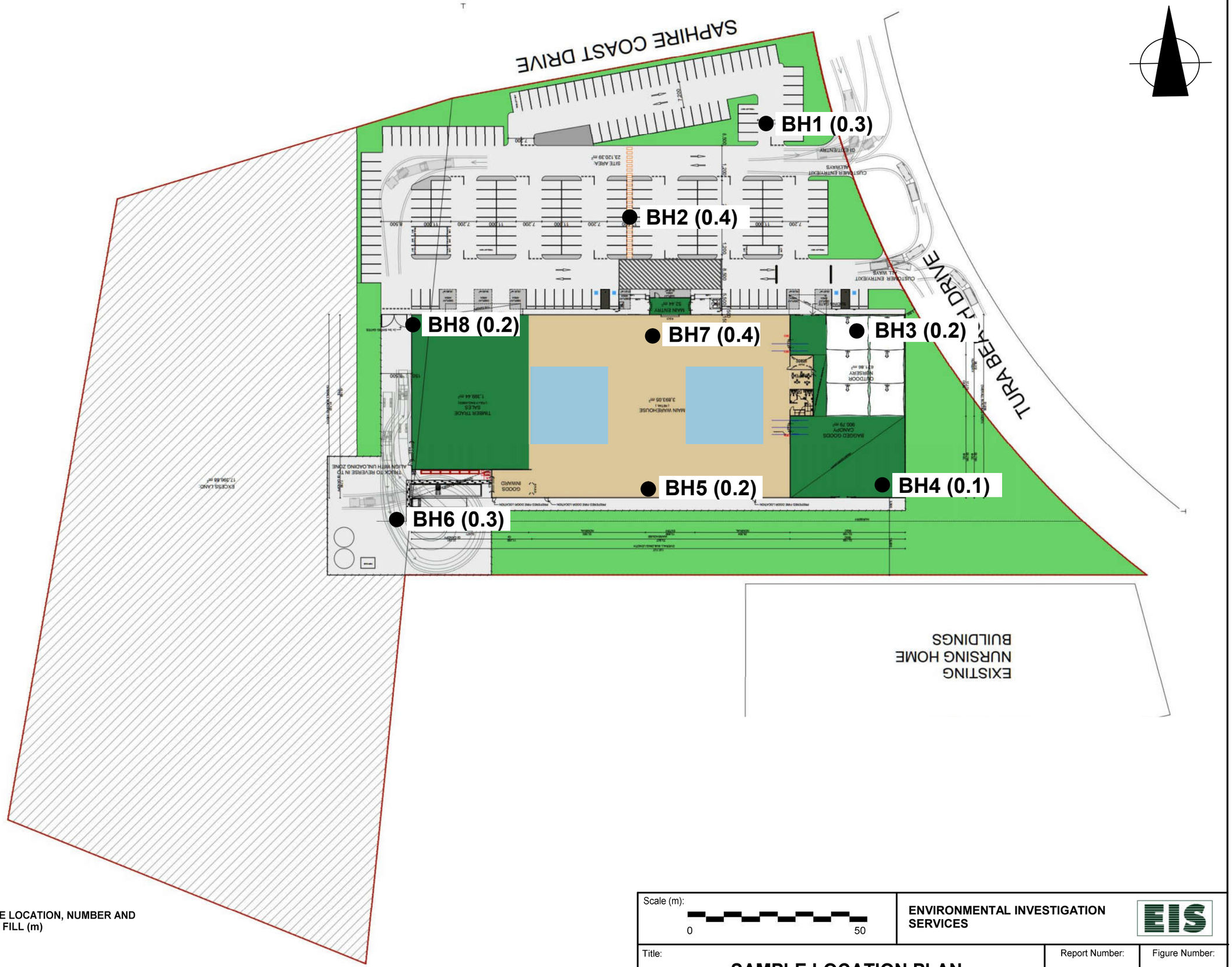
N

NOTES:
Figure 1 has been recreated from Google Earth Pro and NSW Department of Lands SIX Maps. Figure is not to scale.

Reference should be made to the report text for a full understanding of this plan.

ENVIRONMENTAL INVESTIGATION SERVICES

Project Number: E28682KB	Title: SITE LOCATION PLAN
Figure: 1	Address: LOTS 33 & 34 DP243029, OFF TURA BEACH DRIVE, TURA BEACH, NSW



LEGEND

● BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

Scale (m): 0 50

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

Title: **SAMPLE LOCATION PLAN**

Report Number: E28682KB

Figure Number: 2

Appendix B: Laboratory Summary Tables

TABLE A
SOIL LABORATORY RESULTS COMPARED TO HILs
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC) [1]			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	2000	7	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0-0.1	Fill - Silty Sand	LPQL	LPQL	7	LPQL	2	LPQL	2	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH1	0.5-0.95	Clayey Gravelly Sand	LPQL	LPQL	17	LPQL	3	LPQL	2	LPQL	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0-0.1	Fill - Silty Sand	LPQL	LPQL	3	1	4	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH3	0-0.1	Fill - Silty Sand	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0-0.1	Fill - Silty Sand	LPQL	LPQL	2	LPQL	2	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0.5-0.95	Clayey Sand	LPQL	LPQL	21	LPQL	4	LPQL	5	2	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0-0.1	Fill - Silty Sand	LPQL	LPQL	1	LPQL	2	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH6	0-0.2	Fill - Silty Sand	LPQL	LPQL	4	LPQL	1	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH7	0-0.1	Fill - Silty Sand	LPQL	LPQL	2	LPQL	2	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0-0.1	Fill - Silty Sand	LPQL	LPQL	7	LPQL	3	LPQL	1	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0.8-1	Sandy Clay	LPQL	LPQL	36	LPQL	4	LPQL	4	2	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples			11	11	11	11	11	11	11	11	11	11	8	8	8	8	8	8	8	8	8	8
Maximum Value			LPQL	LPQL	36	1	4	LPQL	5	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-D: 'Commercial/Industrial'
2 - The results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons	UCL: Upper Level Confidence Limit on Mean Value
B(a)P: Benzo(a)pyrene	HILs: Health Investigation Levels
PQL: Practical Quantitation Limit	NA: Not Analysed
LPQL: Less than PQL	NC: Not Calculated
OPP: Organophosphorus Pesticides	NSL: No Set Limit
OCP: Organochlorine Pesticides	SAC: Site Assessment Criteria
PCBs: Polychlorinated Biphenyls	NEPM: National Environmental Protection Measure

TABLE B
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					**COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH1	0.5-0.95	Clayey Gravelly Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0.5-0.95	Clayey Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.4
BH6	0-0.2	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH7	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.3
BH8	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.6
BH8	0.8-1	Sandy Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					11	11	11	11	11	11	11	11
Maximum Value					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.6

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:

UCL: Upper Level Confidence Limit on Mean Value	NC: Not Calculated	PQL: Practical Quantitation Limit
HSLs: Health Screening Levels	NL: Not Limiting	LPQL: Less than PQL
NA: Not Analysed	SAC: Site Assessment Criteria	NEPM: National Environmental Protection Measure

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1
HSL Land Use Category [1]					**COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH1	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH1	0.5-0.95	Clayey Gravelly Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH2	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH3	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH4	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH4	0.5-0.95	Clayey Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH5	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH6	0-0.2	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH7	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH8	0-0.1	Fill - Silty Sand	0m to < 1m	Sand	260	NL	3	NL	NL	230	NL
BH8	0.8-1	Sandy Clay	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL

TABLE C
SOIL LABORATORY RESULTS COMPARED TO EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) [2]				-	-	-	NSL	9	11	NSL	5	24	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	7	LPQL	2	2	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH1	0.5-0.95	Clayey Gravelly Sand	Coarse	NA	NA	NA	LPQL	17	LPQL	3	2	LPQL	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	3	1	4	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH3	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	2	LPQL	2	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	0.5-0.95	Clayey Sand	Coarse	NA	NA	NA	LPQL	21	LPQL	4	5	2	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	1	LPQL	2	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0-0.2	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	4	LPQL	1	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH7	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	2	LPQL	2	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	LPQL	7	LPQL	3	1	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.8-1	Sandy Clay	Fine	NA	NA	NA	LPQL	36	LPQL	4	4	2	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of Samples							11	11	11	11	11	11	11	8	11	11	11	11	11	11	11	11	11
Maximum Value							LPQL	36	1	4	5	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - ABC Values for selected metals has been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for new suburbs with low traffic have been quoted)

Concentration above the SAC VALUE
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

Abbreviations:

EILs: Ecological Investigation Levels
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
UCL: Upper Level Confidence Limit on Mean Value
ESLs: Ecological Screening Levels
NA: Not Analysed
LPQL: Less than PQL
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure
NC: Not Calculated
NSL: No Set Limit
ABC: Ambient Background Concentration

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) [2]				-	-	-	NSL	9	11	NSL	5	24	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH1	0.5-0.95	Clayey Gravelly Sand	Coarse	NA	NA	NA	100	199	71	1100	35	70	710	--	180	120	300	2800	50	85	70	105	0.7
BH2	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH3	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	70	710	180	180	120	300	2800	50	85	70	105	0.7
BH4	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH4	0.5-0.95	Clayey Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	--	180	120	300	2800	50	85	70	105	0.7
BH5	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH6	0-0.2	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH7	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH8	0-0.1	Fill - Silty Sand	Coarse	NA	NA	NA	100	199	71	1100	35	94	710	180	180	120	300	2800	50	85	70	105	0.7
BH8	0.8-1	Sandy Clay	Fine	NA	NA	NA	100	199	71	1100	35	94	710	--	180	120	1300	5600	60	105	125	45	0.7

TABLE D
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES (2014)
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful [2]	Total Scheduled[3]		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1 [1]			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1 [1]			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2 [1]			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2 [1]			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	Fill - Silty Sand	LPQL	LPQL	7	LPQL	2	LPQL	2	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH1	0.5-0.95	Clayey Gravelly Sand	LPQL	LPQL	17	LPQL	3	LPQL	2	LPQL	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH2	0-0.1	Fill - Silty Sand	LPQL	LPQL	3	1	4	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH3	0-0.1	Fill - Silty Sand	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0-0.1	Fill - Silty Sand	LPQL	LPQL	2	LPQL	2	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0.5-0.95	Clayey Sand	LPQL	LPQL	21	LPQL	4	LPQL	5	2	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH5	0-0.1	Fill - Silty Sand	LPQL	LPQL	1	LPQL	2	LPQL	LPQL	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH6	0-0.2	Fill - Silty Sand	LPQL	LPQL	4	LPQL	1	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH7	0-0.1	Fill - Silty Sand	LPQL	LPQL	2	LPQL	2	LPQL	LPQL	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0-0.1	Fill - Silty Sand	LPQL	LPQL	7	LPQL	3	LPQL	1	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	0.8-1	Sandy Clay	LPQL	LPQL	36	LPQL	4	LPQL	4	2	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
Total Number of samples			11	11	11	11	11	11	11	11	11	11	8	8	8	8	8	11	11	11	11	11	11	11	11	11	8
Maximum Value			LPQL	LPQL	36	1	4	LPQL	5	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:
[1] - NSW EPA Waste Classification Guidelines (2014)
[2] - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion
[3] - Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde

Concentration above the CT1 — VALUE
Concentration above SCC1 — VALUE
Concentration above the SCC2 — VALUE

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons	UCL: Upper Level Confidence Limit on Mean Value	CT: Contaminant Threshold
B(a)P: Benzo(a)pyrene	NA: Not Analysed	SCC: Specific Contaminant Concentration
PQL: Practical Quantitation Limit	NC: Not Calculated	HILs: Health Investigation Levels
LPQL: Less than PQL	NSL: No Set Limit	NEPM: National Environmental Protection Measure
PID: Photoionisation Detector	SAC: Site Assessment Criteria	BTEX: Monocyclic Aromatic Hydrocarbons
PCBs: Polychlorinated Biphenyls	TRH: Total Recoverable Hydrocarbons	

TABLE E
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH2 (0-0.1m)	Arsenic	4	LPQL	LPQL	NC	NC
Dup Ref = DUP1	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	3	5	4.0	50
Envirolab Report: 133414	Copper	1	1	LPQL	0.8	67
	Lead	1	4	2	3.0	67
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	LPQL	1	0.8	67
	Zinc	1	2	2	2.0	0
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	LPQL	LPQL	NC	NC
	Benzo(a)pyrene	0.05	LPQL	LPQL	NC	NC
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)pyrene TEQ	0.5	LPQL	LPQL	NC	NC
	TRH C_6-C_{10} (F1)	25	LPQL	LPQL	NC	NC
	TRH >C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	TRH >C_{16}-C_{34} (F3)	100	LPQL	LPQL	NC	NC
	TRH >C_{34}-C_{40} (F4)	100	LPQL	LPQL	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	LPQL	LPQL	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable
Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable
If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls
TRH: Total Recoverable Hydrocarbons

TABLE F
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TBS 27/08/2015 133414
	mg/kg	µg/L	mg/kg
Benzene	1	1	LPQL
Toluene	1	1	LPQL
Ethylbenzene	1	1	LPQL
m+p-xylene	2	2	LPQL
o-xylene	1	1	LPQL

Explanation:
[W] Sample type (water)
[S] Sample type (sand)
BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
TB: Trip Blank
TS: Trip Spike
RS: Rinsate Sample
TRH: Total Recoverable Hydrocarbons

Appendix C: Site Information including Site History

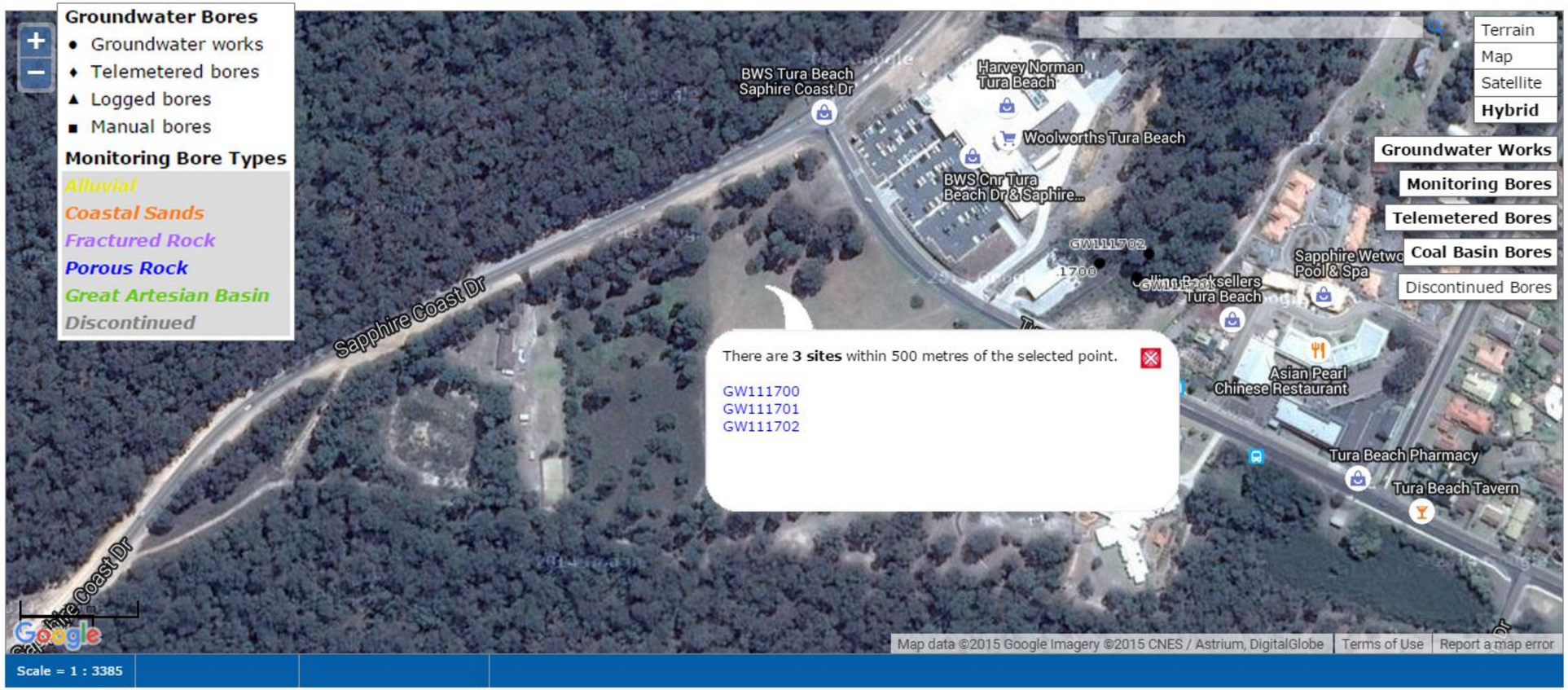
Groundwater Bore Records

All Groundwater
find a site

South Coast Region

All data times are Eastern Standard Time

Map



NSW Office of Water
Work Summary

GW111700

Licence: 10BL604303 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 30/09/2010
Final Depth: 7.50 m
Drilled Depth: 7.50 m

Contractor Name:
Driller: Daniel Giles Fox
Assistant Driller:

Property: WOOLWORTHS LOT 1196 TURA BEACH DRIVE TURA BEACH 2548 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	AUCKL	AUCKL.5	2//1159617
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 5916316.0
Easting: 759796.0
Latitude: 36°51'48.2"S
Longitude: 149°54'51.4"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.50	100			Auger - Solid Flight
1		Annulus	Bentonite/Grout	3.00	4.00				
1		Annulus	Waterworn/Rounded	4.00	7.50				Graded
1	1	Casing	Steel Stainless 316	0.00	4.50	50	44		Seated on Bottom
1	1	Opening	Slots - Horizontal	4.50	7.50	50		1	Casing - Machine Slotted, Stainless Steel 316, Screwed, A: 1.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	SAND CLAYEY,DAMP	Clayey Sand	
1.50	7.50	6.00	SAND CLAYEY,DAMP TO MOIST	Clayey Sand	

Remarks

***** End of GW111700 *****

NSW Office of Water
Work Summary

GW111701

Licence: 10BL604303 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 30/09/2010
Final Depth: 6.50 m
Drilled Depth: 8.00 m

Contractor Name:
Driller: Daniel Giles Fox
Assistant Driller:

Property: WOOLWORTHS LOT 1196 TURA BEACH DRIVE TURA BEACH 2548 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	AUCKL	AUCKL.5	2//1159617
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 5916305.0
Easting: 759822.0
Latitude: 36°51'48.5"S
Longitude: 149°54'52.5"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.50	100			Auger - Solid Flight
1		Annulus	Bentonite/Grout	2.00	3.00				
1		Annulus	Waterworn/Rounded	3.00	6.50				Graded
1	1	Casing	Steel Stainless 316	0.00	3.50	50	44		Suspended in Clamps
1	1	Opening	Slots - Horizontal	3.50	6.50	50		1	Casing - Machine Slotted, Stainless Steel 316, Screwed, A: 1.00mm

Water Bearing Zones

From	To	Thickness	WBZ Type	S.W.L.	D.D.L.	Yield	Hole	Duration	Salinity

(m)	(m)	(m)		(m)	(m)	(L/s)	Depth (m)	(hr)	(mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.00	2.00	SAND DAMP	Sand	
2.00	3.50	1.50	SAND CLAYEY,DAMP TO MOIST	Clayey Sand	
3.50	8.00	4.50	SAND	Sand	

Remarks

***** End of GW111701 *****

NSW Office of Water
Work Summary

GW111702

Licence: 10BL604303 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 30/09/2010
Final Depth: 7.50 m
Drilled Depth: 8.00 m

Contractor Name:
Driller: Daniel Giles Fox
Assistant Driller:

Property: WOOLWORTHS LOT 1196 TURA BEACH DRIVE TURA BEACH 2548 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	AUCKL	AUCKL.5	2//1159617
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 5916321.0
Easting: 759830.0
Latitude: 36°51'48.0"S
Longitude: 149°54'52.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.50	100			Auger - Solid Flight
1		Annulus	Bentonite/Grout	3.00	4.00				
1		Annulus	Waterworn/Rounded	4.00	7.50				Graded
1	1	Casing	Steel Stainless 316	0.00	4.50	50	44		Suspended in Clamps
1	1	Opening	Slots - Horizontal	4.50	7.50	50		1	Casing - Machine Slotted, Stainless Steel 316, Screwed

Water Bearing Zones

From	To	Thickness	WBZ Type	S.W.L.	D.D.L.	Yield	Hole	Duration	Salinity

(m)	(m)	(m)		(m)	(m)	(L/s)	Depth (m)	(hr)	(mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	SAND CLAYEY,DAMP	Clayey Sand	
1.50	6.90	5.40	SAND CLAYEY,DAMP TO MOIST	Clayey Sand	
6.90	8.00	1.10	SAND	Sand	

Remarks

***** End of GW111702 *****

EIS

Land Title Records

VB

27 AUG 2015

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9644 1679
Mobile: 0412 169 809
Facsimile: +612 8076 3026
Email: alsearch@optusnet.com.au

27th August, 2015

ENVIRONMENTAL INVESTIGATION SERVICES
PO BOX 976,
NORTH RYDE BC NSW 1670

Attention: Vittal Boggaram

RE: **Off Tura Beach Road,**
Tura Beach
Job Reference E28682KB

Note 1:	**Lot 33**	**DP 243029**	(page 1)
Note 2:	**Lot 34**	**DP 243029**	(page 4)

Note 1:

Current Search

Folio Identifier 33/243029 (title attached)
DP 243029 (plan attached)
Dated 25th August, 2015
Registered Proprietor:
INGOW PTY LIMITED

Title Tree
Lot 33 DP 243029

Folio Identifier 33/243029

Certificate of Title Volume 11876 Folio 53

Certificate of Title Volume 11641 Folio 32

(a)

CTVol 11418 Folio 226

CTVol 749 Folio 21

****

(b)

CTVol 11418 Folio 225

CTVol 749 Folio 20

****

Summary of proprietors
Lot 33 DP 243029

Year	Proprietor
	(Lot 33 DP 243029)
2003 – todate	Ingow Pty Limited
1996 – 2003	Kevin Roy Arnott Evangeline Arnott
1993 – 1996	A.V. Jennings Limited *(formerly JIL Properties Pty Limited)*
1993 – 1996	Jennings Group Limited *(formerly Jennings Industries Limited)*
1988 – 1993	Jennings Industries Limited
	(Lot 33 DP 243029 – CTVol 11876 Fol 53)
1976 – 1988	Jennings Industries Limited
1973 – 1976	Richard Susani, carpenter
1972 – 1973	Hawkshead Pty Limited
	(Lot 101 DP 548914 – CTVol 11641 Fol 32)
1971 – 1972	Hawkshead Pty Limited

See Notes (a) & (b)

Note (a)

	(Portion 61 Parish of Bournda – CTVol 11418 Fol 226)
1970 – 1971	Hawkshead Pty Limited
	(Portion 61 Parish of Bournda – Area 58 Acres 2 Roods – CTVol 749 Fol 21)
1970 – 1970	Hawkshead Pty Limited
1968 – 1970	David William Andrew Stevenson
1962 – 1968	David William Stevenson, contractor
1951 – 1962	Moses Victor hart, drover
1920 – 1951	Percy James Waterson, farmer
1920 – 1920	Randolph Cameron Munn, farmer
1912 – 1920	The Australian Bank of Commerce Limited
1885 – 1912	Armstrong Lockhart Munn, freeholder / grantee

****

Note (b)

	(Portion 60 Parish of Bournda – CTVol 11418 Fol 225)
1970 – 1971	Hawkshead Pty Limited
	(Portion 60 Parish of Bournda – Area 74 Acres 2 Roods – CTVol 749 Fol 20)
1970 – 1970	Hawkshead Pty Limited
1968 – 1970	David William Andrew Stevenson
1962 – 1968	David William Stevenson, contractor
1951 – 1962	Moses Victor Hart, drover
1920 – 1951	Percy James Waterson, farmer
1920 – 1920	Randolph Cameron Munn, farmer
1912 – 1920	The Australian Bank of Commerce Limited
1885 – 1912	Armstrong Lockhart Munn, freeholder / grantee

****

Note 2:

Current Search

Folio Identifier 34/243029 (title attached)
DP 243029 (plan attached)
Dated 25th August, 2015
Registered Proprietor:
INGOW PTY LIMITED

Title Tree
Lot 34 DP 243029

Folio Identifier 34/243029

Certificate of Title Volume 11876 Folio 54

Certificate of Title Volume 11641 Folio 32

Certificate of Title Volume 11418 Folio 225

Certificate of Title Volume 749 Folio 20

****

Summary of proprietors
Lot 34 DP 243029

Year	Proprietor
	(Lot 34 DP 243029)
2003 – todate	Ingow Pty Limited
1998 – 2003	Mulnot Pty Limited
1988 – 1998	Elizabeth Maria Gross, married woman
	(Lot 34 DP 243029 – CTVol 11876 Fol 54)
1973 – 1988	Elizabeth Maria Gross, married woman
1972 – 1973	Hawkshead Pty Limited
	(Lot 101 DP 548914 – CTVol 11641 Fol 32)
1971 – 1972	Hawkshead Pty Limited
	(Portion 60 Parish of Bournda – CTVol 11418 Fol 225)
1970 – 1971	Hawkshead Pty Limited
	(Portion 60 Parish of Bournda – Area 74 Acres 2 Roods – CTVol 749 Fol 20)
1970 – 1970	Hawkshead Pty Limited
1968 – 1970	David William Andrew Stevenson
1962 – 1968	David William Stevenson, contractor
1951 – 1962	Moses Victor Hart, drover
1920 – 1951	Percy James Waterson, farmer
1920 – 1920	Randolph Cameron Munn, farmer
1912 – 1920	The Australian Bank of Commerce Limited
1885 – 1912	Armstrong Lockhart Munn, freeholder / grantee

****

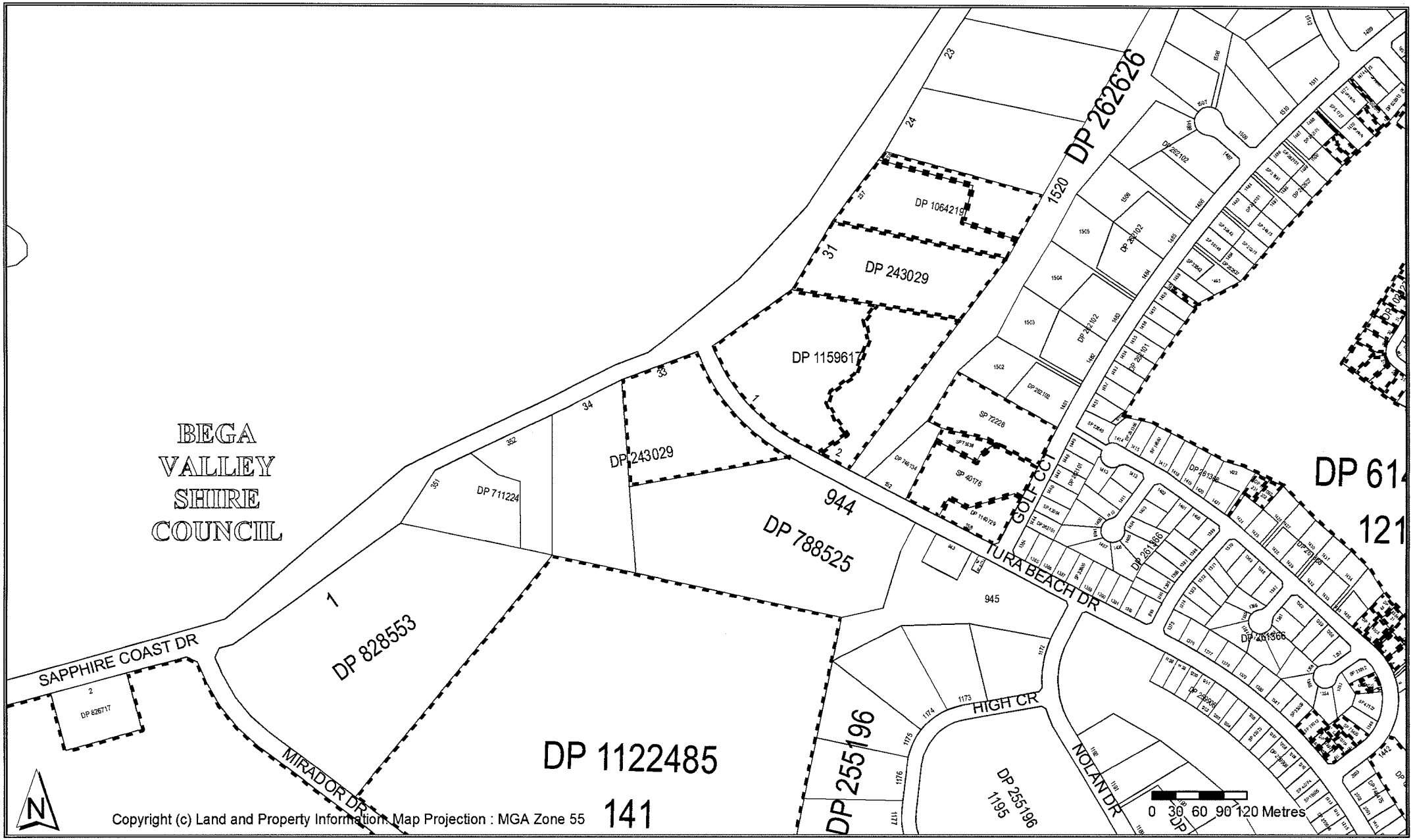
Land & Property Information
Finance & Services

Cadastral Records Enquiry Report

Ref : EIS - Tura Beach

Requested Parcel : Lot 33 DP 243029 **Identified Parcel :** Lot 33 DP 243029

Locality : TURA BEACH **LGA :** BEGA VALLEY **Parish :** BOURNDA **County :** AUCKLAND



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.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 33/243029

SEARCH DATE	TIME	EDITION NO	DATE
25/8/2015	8:25 AM	5	22/11/2010

LAND

LOT 33 IN DEPOSITED PLAN 243029
AT MERRIMBULA
LOCAL GOVERNMENT AREA BEGA VALLEY
PARISH OF BOURNDA COUNTY OF AUCKLAND
TITLE DIAGRAM DP243029

FIRST SCHEDULE

INGOW PTY LIMITED (T 9350136)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 N517526 COVENANT
3 DP1158931 EASEMENT FOR WATER SUPPLY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1158931

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

ef:EIS - Tura Beach /Src:T

RP13

[redacted]

TRANSFER

Real Property Act, 1900

I 878840 B

Office of State Revenue use only

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 1992/93 P20 NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

B

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

SEE ANNEXURE

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
238N	BLAKE DAWSON WALDRON SOLICITORS 225 GEORGE STREET, SYDNEY NSW 2000 REFERENCE (max. 15 characters):KBR.MZN.3519/93

(C) **TRANSFEROR** JENNINGS GROUP LIMITED ACN 004 283 523 (FORMERLY KNOWN AS JENNINGS INDUSTRIES LIMITED)

(D) acknowledges receipt of the consideration of $996,577-00

and as regards the land specified above transfers to the transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T

JIL PROPERTIES ~~PTY~~ LIMITED ACN 004 601 503

as joint tenants/tenants in common

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 1992/93 P45 ALTERATION NOTED

(G)

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900.

DATE 17/8/93

Signed in my presence by the transferor who is personally known to me.

THE COMMON SEAL of JENNINGS GROUP LIMITED ACN 004 283 523 was hereunto affixed in accordance with its Articles of Association and in the presence of:

JENNINGS GROUP LIMITED A.C.N. 004 283 523 The Common Seal of

Secretary

PETER ANTHONY COUGHLIN

Signature of Transferor

TERRENCE NOEL MEREDITH Director

Signed in my presence by the transferee who is personally known to me.

THE COMMON SEAL of JIL PROPERTIES ~~PTY~~ LIMITED ACN 004 601 503 was hereunto affixed in accordance with its Articles of Association and in the presence of:

JIL PROPERTIES LIMITED A.C.N. 004 601 503 THE COMMON SEAL OF

Secretary

PETER ANTHONY COUGHLIN

Signature of Transferee

Director

DOUGLAS JAMES RIDLEY

☞ **INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE**

CHECKED BY (office use only)

B

THIS IS THE ANNEXURE "A" REFERRED TO IN THE TRANSFER BETWEEN JENNINGS GROUP LIMITED ACN 004 283 523 (FORMERLY KNOWN AS JENNINGS INDUSTRIES LIMITED) AS TRANSFEROR AND JIL PROPERTIES LIMITED ACN 004 601 503 AS TRANSFEREE DATED

LAND TRANSFERRED:

1837/730224

~~1897/730224~~ 1897/730225

~~3263/793192~~

3267/793192

3268/793192

33/243029

944/788525

3311/786030

3337/786028

3338/786028

1249/260296

1297/260295

JENNINGS GROUP LIMITED (Formerly JENNINGS INDUSTRIES LIMITED)

.....
Director

.....
Secretary

Tura Beach

JIL PROPERTIES LIMITED

.....
Director

.....
Secretary

ef:EIS - Tura Beach /Src:T

97-01T

TRANSFER

Real Property Act, 1900

2404439 A

Office of State Revenue use only

21/08/1996 $2.00 994001946 6
1759440 33/243029 TFR
A V JENNINGS PTY L K R & E ARNOTT
$55000.00 $0.48642 357

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

CERTIFICATE OF TITLE FOLIO IDENTIFIER 33/243029

Stat-Decl

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
39u	REED HANIGAN & T... LAW STATIONERS SY... DX. 452 SYDNEY. PH... REFERENCE (max. 15 characters): Britten - Arnott

(C) **TRANSFEROR** A.V. JENNINGS LIMITED (ACN 004 601 503)

(D) acknowledges receipt of the consideration of FIFTY FIVE THOUSAND DOLLARS ($55,000.00)
and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T TS (s713 LGA) TW (Sheriff)	KEVIN ROY ARNOTT and EVANGELINE ARNOTT

(G) **TENANCY:** Joint

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 15TH AUGUST 1996.

~~Signed in my presence by the Transferor who is personally known to me.~~

Executed by AVJennings Limited by its duly appointed attorney JOHN CARLYLE RICHARDS pursuant to Power of Attorney Book 4031 No. 533

~~THE COMMON SEAL OF A.V. JENNINGS LIMITED~~
~~Signature of Witness~~

~~(ACN 004 601 503) WAS HEREUNTO AFFIXED~~
~~Name of Witness (BLOCK LETTERS)~~

IN THE PRESENCE OF:- Gaynor M. Coates
~~Address of Witness~~

GAYNOR M. COATES.
600 Springvale Road, Mulgrave

~~See~~

~~Dir~~

Signature of Transferor

Signed in my presence by the Transferee who is personally known to me.

Gaynor M. Coates
Signature of Witness

GAYNOR COATES
Name of Witness (BLOCK LETTERS)

600 SPRINGVALE RD, MULGRAVE
Address of Witness

Signature of Transferee's Solicitor

M G S BRITTEN

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

AUSDOC Office Pty. Ltd.

Ø EVIDENCE SIGNED RE C/NAME M.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
25/8/2015 8:26AM

FOLIO: 33/243029

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 11876 FOL 53

Recorded	Number	Type of Instrument	C.T. Issue
5/6/1987		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
13/1/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
7/12/1993	I846595	APPLICATION	EDITION 1
15/12/1993	I878840	TRANSFER	EDITION 2
23/8/1996	2404439	TRANSFER	EDITION 3
5/2/2003	9350136	TRANSFER	EDITION 4
22/11/2010	DP1158931	DEPOSITED PLAN	EDITION 5

*** END OF SEARCH ***

EIS - Tura Beach PRINTED ON 25/8/2015

Ref:als /Sec:T

NEW SOUTH WALES

C[redacted]CATE OF TITLE

[redacted]ROPERTY ACT, 1900

Vol. 11876 Fol. 53

11876 Fol. 53

(Page 1) Vol. 11876 Fol. 53

Crown Grants Vol. 749 Fols.20 and 21
Prior Title Vol.11641 Fol. 32

Edition issued 10-7-1972

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.

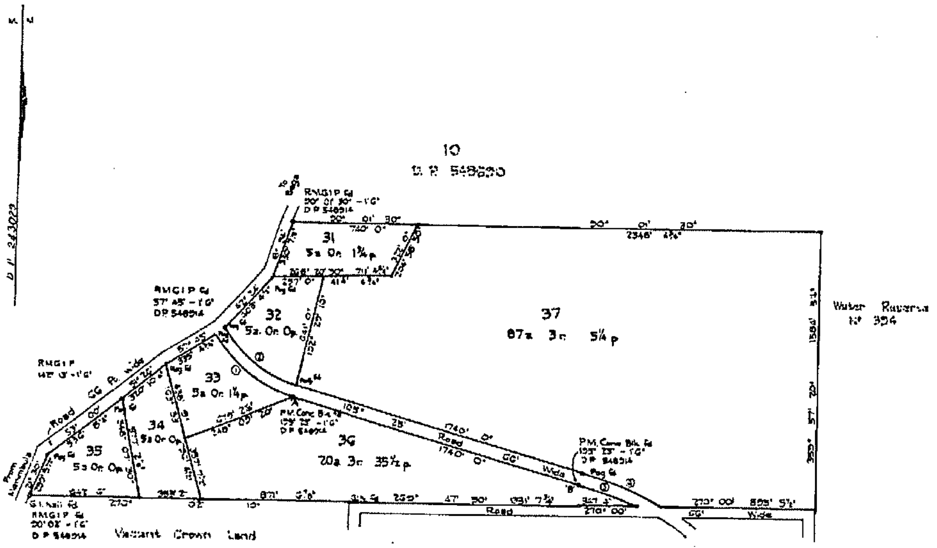
CANCELLED

Registrar General.

SEE AUTO FOLIO

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

PLAN SHOWING LOCATION OF LAND



SCHEDULE OF CURVED BOUNDARIES

Nº	RADIUS	ARC	CHORD	
1	808' 0"	527' 0"	176' 35	509' 0¼"
2	742' 0"	548' 2¾"	303' 35	535' 0¼"
3	1367' 0"	300' 3¼"	110' 45'	305' 5"
4	2037' 0"	505' 4⅞"	292' 32' 20"	504' 1"

S

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 33 in Deposited Plan 243029 at Merrimbula in the Shire of Imlay Parish of Bournda and County of Auckland.

FIRST SCHEDULE

~~HAWKSHEAD PTY. LTD.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
2. ~~Mortgage No.L945811 to David William Andrew Stevenson of Bega, Contractor. Entered 12-8-1970.~~ Discharged M588195.
3. ~~Mortgage No.M427716 to Associated Securities Limited. Entered 22-9-1971.~~ Discharged M888197.

Registrar General

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

Vol. 11876 Fol. 53

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
~~Richard Sussani of Boydtown via Eden, Carpenter~~	~~Transfer~~	~~N517526~~	~~20-7-1973~~	~~29-10-1973~~	[signature]
Janneings Industries Limited	Transfer	P825302	------	29-7-1976	[signature]

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Mortgage~~	~~M888198~~	~~10-8-1972~~	~~to Associated Securities Finance Limited~~	~~20-9-1972~~	[signature]	Discharged	N517525	[signature]
~~Mortgage~~	~~N202389~~	~~23-3-1973~~	~~to Associated Securities Finance Limited.~~	~~4-5-1973~~	[signature]	Discharged	N517525	[signature]
~~Mortgage~~	~~N202390~~	~~23-3-1973~~	~~to Associated Securities Limited~~	~~4-5-1973~~	[signature]	Discharged	N517524	[signature]
Covenant	N517526	~~20-7-1973~~	Created by Transfer No N517526	29-10-1973	[signature]			
~~Mortgage~~	~~N517527~~	~~10-10-1973~~	~~to Hawkstone Pty. Limited~~	~~29-10-1973~~	[signature]	Discharged	P825301	[signature]

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

(Page 2 of 2 pages)

Ref: als /Src:T

N202389
N517526
N590091
P825301

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 34/243029

SEARCH DATE	TIME	EDITION NO	DATE
25/8/2015	8:26 AM	4	8/5/2003

LAND

LOT 34 IN DEPOSITED PLAN 243029
AT MERRIMBULA
LOCAL GOVERNMENT AREA BEGA VALLEY
PARISH OF BOURNDA COUNTY OF AUCKLAND
TITLE DIAGRAM DP243029

FIRST SCHEDULE

INGOW PTY LIMITED (T 9586979)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 Q12396 EASEMENT FOR WATER SUPPLY AFFECTING THAT PART OF THE LAND WITHIN DESCRIBED SHOWN AS 6 WIDE AND DESIGNATED (X) IN THE PLAN ANNEXED TO Q12396
3 Q12397 EASEMENT FOR WATER SUPPLY AFFECTING THAT PART OF THE LAND WITHIN DESCRIBED SHOWN AS 6 WIDE AND DESIGNATED (X) IN THE PLAN ANNEXED TO Q12396

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 ***

ef:EIS - Tura Beach /Src:T
97-011

TRANSFER

Real Property Act, 1900

3533195 F

Office of State Revenue use only

$2-
$2.00
N.S.W. STAMP DUTY
161097 5202 04 900316749/03

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

CERTIFICATE OF TITLE FOLIO IDENTIFIER 34/243029

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
323X	J. F. GALE & LENEHAN
	REFERENCE (max. 15 characters): ESB

(C) **TRANSFEROR** ELIZABETH MARIA GROSS

(D) acknowledges receipt of the consideration of NINETY FIVE THOUSAND DOLLARS ($95,000.00)
and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T TS (s713 LGA) TW (Sheriff)	ACN - 006 050 120 MULNOT PTY LIMITED ~~AS TRUSTEE FOR W G FERTILISERS SUPERANNUATION FUND~~

(G) ~~TENANCY:~~

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 7th October 1997
Signed in my presence by the Transferor who is personally known to me.

.....
Signature of Witness

B.R. ENNIS
Name of Witness (BLOCK LETTERS)

BATEMANS BAY SOLICITOR
Address of Witness

E. Gross
Signature of Transferor

Signed in my presence by the Transferee who is personally known to me.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

(B.R. ENNIS)
Solicitor ~~Signature of~~ Transferee

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

Ennis, Smith & Bradbury

Solicitors and Attorneys

SUITE 1, ST. GEORGE MALL
ORIENT STREET, BATEMANS BAY

Branch Office
114 WAGONGA STREET, NAROOMA
Telephone: (02) 4476 1108
(Tuesdays and Thursdays)

BARRIE R. ENNIS B.Ec. LL.B.
I. JOSEPH SMITH Dip.Law (SAB)

Please address all correspondence to
P.O. BOX 204, BATEMANS BAY N.S.W. 2536
DX 4891 BATEMANS BAY
FAX: (02) 4472 4773

Telephone: (02) 4472 6355 (6 lines)

Our Ref: BRE:RL:952319

Your Ref:

27 November, 1997

FT 3.11.97

The Officer in Charge
Land Title's Office
DX 17
SYDNEY

FAX NO: 02 9 223 8114

Dear Sirs,

RE: RUELLE NOMINEES PTY LTD - DEALING NUMBER 3533195
RE: CERTIFICATE OF TITLE FOLIO IDENTIFIER 34/243029

As solicitors for Ruelle Nominees Pty Ltd and the solicitors who instructed AusSearch to lodge the abovementioned dealing number at the Land Title's Office we hereby authorise and direct that the Certificate of Title following registration be forwarded to:

MacPherson & Kelly
Solicitors
PO Box 343
DANDENONG VIC 3175

Yours faithfully,
ENNIS SMITH & BRADBURY

Per:

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
25/8/2015 8:28AM

FOLIO: 34/243029

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 11876 FOL 54

Recorded	Number	Type of Instrument	C.T. Issue
5/6/1987		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
25/2/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
22/11/1995	O708994	DEPARTMENTAL DEALING	
22/11/1995	O209066	MORTGAGE	EDITION 1
15/5/1997	3063524	CAVEAT	
2/6/1997	3108820	CAVEAT	
7/10/1997	3470139	CAVEAT	
5/2/1998	3533193	WITHDRAWAL OF CAVEAT	
5/2/1998	3756753	WITHDRAWAL OF CAVEAT	
5/2/1998	3766770	WITHDRAWAL OF CAVEAT	
5/2/1998	3533194	DISCHARGE OF MORTGAGE	
5/2/1998	3533195	TRANSFER	
6/2/1998	3643391	MORTGAGE	EDITION 2
25/11/1998	5421497	DISCHARGE OF MORTGAGE	
25/11/1998	5421498	MORTGAGE	EDITION 3
8/5/2003	9586978	DISCHARGE OF MORTGAGE	
8/5/2003	9586979	TRANSFER	EDITION 4

*** END OF SEARCH ***

C[redacted]CATE OF TITLE

NEW SOUTH WALES [redacted]PROPERTY ACT, 1900

Vol. 11876 Fol. 54

Crown Grant Vol. 749 Fol. 20

Prior Title Vol. 11641 Fol. 32

Edition issued 10-7-1972

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.

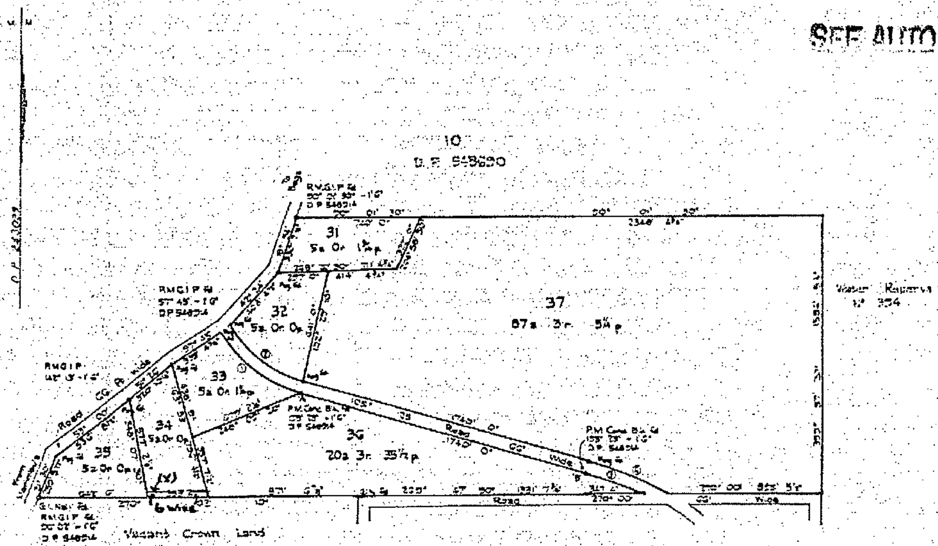
J. Watson
Registrar General.

CANCELLED

SEE AUTO FOLIO

(Page 1) Vol. 11876 Fol. 54

PLAN SHOWING LOCATION OF LAND



SCHEDULE OF CURVED BOUNDARIES

Nº	RADIUS	ARC	CHORD
1	508' 0"	577' 0"	122° 35' 557' 3½"
2	742' 0"	548' 2¾"	305° 35' 535' [illegible]
3	1067' 0"	350' 3¾"	[illegible] 45' 305' 9"
4	2033' 0"	505' 4½"	[illegible] 32' 22" 504' 1"

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

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

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 34 in Deposited Plan 243029 at Merrimbula in the Shire of Imlay Parish of Bournda and County of Auckland.

FIRST SCHEDULE

~~HAWKSHEAD PTY. LTD.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. ~~Mortgage No. L945811 to David William Andrew Stevenson of Bega, Contractor. Entered 12-8-1970~~ Discharged N388185.
3. ~~Mortgage No. M427716 to Associated Securities Limited. Entered 22-9-1971.~~ Discharged N388187.

J. Watson
Registrar General

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

Vol. 11876 Fol. 54

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
Elizabeth Maria Cross of Mount Waverley, in the State of Victoria, Married Woman.	Transfer	N472739	16-8-1973	5-10-1973	

CANCELLED

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

NATURE	INSTRUMENT NUMBER	DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Mortgage~~	~~M888198~~	~~10-8-1972~~	~~to Associated Securities Finance Limited~~	~~20-9-1972~~		Discharged	N472738	
~~Mortgage~~	~~N202389~~	~~23-3-1973~~	~~to Associated Securities Finance Limited~~	~~4-5-1973~~		Discharged	N472738	
~~Mortgage~~	~~N202390~~	~~23-3-1973~~	~~to Associated Securities Limited~~	~~4-5-1973~~		Discharged	N472738	
Covenant	N472739		Created by Transfer No. N472739	5-10-1973				
~~Mortgage~~	~~N472740~~	~~6-9-1973~~	~~to Hawksheadd Pty Limited~~	~~5-10-1973~~		Discharged	P747756	
EF Transfer	Q12396		Easement for Water Supply (as more fully set out in the said instrument) appurtenant to the land comprised in Certificates of Title Volume 11418 Folios 227 & 228, Volume 11641 Folios 34 & 35, Volume 11876 Folios 56 & 57 and Volume 12057 Fol. 139 affecting that part of the land within described shown as "6 wide" and designated (X) in the plan hereon annexed to Q12396	10-6-1977				
EF Transfer	Q12397		Easement for Water Supply (as more fully set out in the said instrument) affecting that part of the land within described shown as "6 wide" and designated (X) in the plan hereon annexed to Q12396	10-6-1977				

(Page 2 of 2 pages)

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

Ref:ALS /Src:T

[redacted]ICATE OF TITLE

NEW SOUTH WALES

[redacted]PERTY ACT, 1900, as amended.

11641032

Vol. 11641 Fol. 32

CANCELLED

Edition issued 3-8-1971

Crown Grants Vol.749 Fols.20 & 21

Prior Titles Vol.11418 Fols.225 & 226

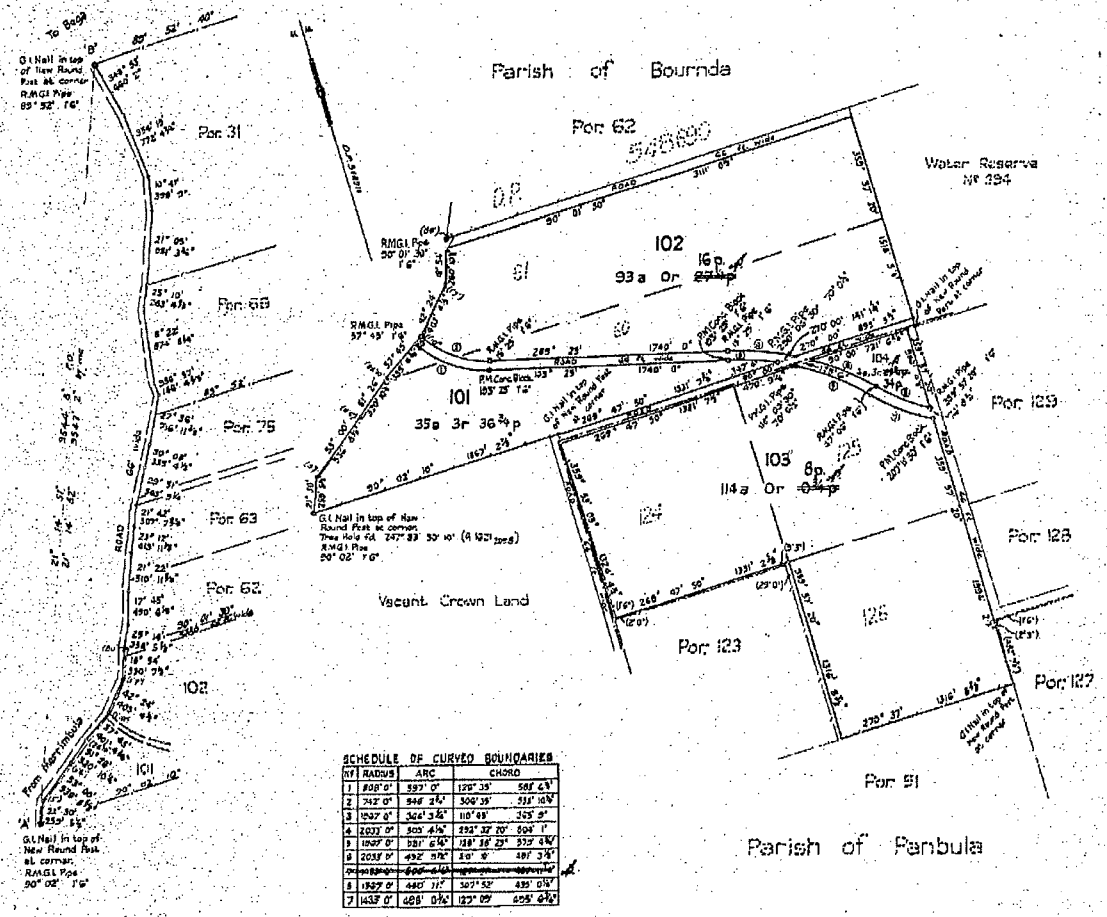
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness J Barnes

Registrar General.

REGISTRAR GENERAL NEW SOUTH WALES

PLAN SHOWING LOCATION OF LAND



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 101 in Deposited Plan 548914 at Merrimbula, in the Shire of Imlay, Parish of Bourndа and County of Auckland.

FIRST SCHEDULE

HAWKSHEAD PTY. LTD.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
2. Mortgage No.I945811 to David William Andrew Stevenson of Bega, Contractor. Entered 12-8-1970.

Registrar General.

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

Fol. 32 Vol. 11641 (Page 1)

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

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

V. C. N. BLIGHT, GOVERNMENT PRINTER

Vol. 11641 Fol 32

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
This deed is cancelled as to Whole					
New Certificates of Title have issued on 18-2-1972					
for lots in Deposited Plan No. 243029 as follows:-					
Lots 3 to 32 Vol. 11876 Fols. 57 to 157 respectively.					
REGISTRAR-GENERAL					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
Mortgage	M427716	8.9.1971	to Associated Securities Limited	22.9.1971				

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

(Page 2 of 2 pages)

Ref: ALS /Src: T

[redacted]

NEW SOUTH WALES

CATE OF TITLE

[redacted]ERTY ACT, 1900, as amended.

Prior Title (Crown Grant)
Vol. 749 Fol. 21

Vol. 11418 Fol. 226

CANCELLED

Edition issued 21-9-1970

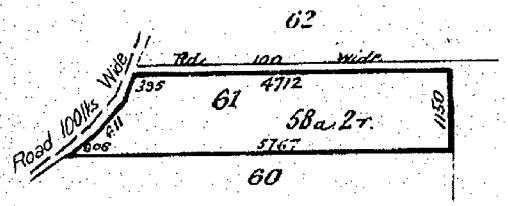
L945811

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.

Witness J Barnes

Registrar General.

PLAN SHOWING LOCATION OF LAND



Scale 20 Chains to an inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portion 61 in the Shire of Imlay Parishof Bournda and County of Auckland.

FIRST SCHEDULE

HAWKSHEAD PTY. LTD.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Mortgage No.L945811 to David William Andrew Stevenson, of Bega, Contractor.
   Entered 12-8-1970.

Registrar General.

Vol. 11418 Fol 226

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to whole (ex road) New Certificates of Title have issued on 3-8-1971 for lots in Deposited Plan No. 548914 as follows:- Lots 101 to 104 Vol. 11641 Fol 32 to 35 respectively. [signature] REGISTRAR GENERAL					
The residue of land in this certificate of title comprises road in D.P. 548914 Entered 13th August 1971. [signature] REGISTRAR GENERAL					

12.5.71
DP 548914

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION

(Page 2 of 2 pages)

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

Ref:ALS /Src:T

NEW SOUTH WALES

CATE OF TITLE

ERTY ACT, 1900, as amended.

Vol. 11418 Fol. 225

Prior Title (Crown Grant)
Vol. 749 Fol. 20

Edition issued 21-9-1970

L945811

CANCELLED

CANCELLED

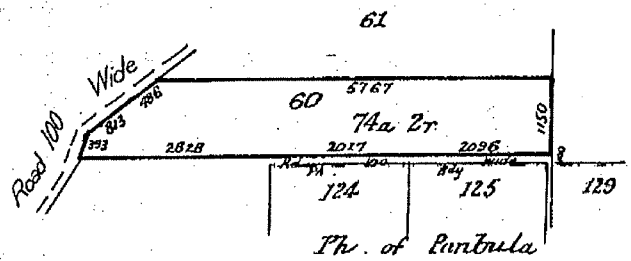
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness Barnes

Registrar General.

(Page 1) Vol. 11418 Fol. 225

PLAN SHOWING LOCATION OF LAND



Scale 20 Chains to an inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portion 60 in the Shire of Imlay Parish of Bournda and County of Auckland.

FIRST SCHEDULE

HAWKSHEAD PTY. LTD.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Mortgage No.L945811 to David William Andrew Stevenson of Bega, Contractor. Entered 12-8-1970.

Registrar General.

Vol. 11418 Fol 225

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	NUMBER	DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to whole (ex road) New Certificates of Title have issued on 3-8-1971 for lots in Deposited Plan No. 548914 as follows:- Lots 101 to 104 Vol. 11641 Fol 32 to 35 respectively. REGISTRAR GENERAL	The residue of land in this certificate of title comprises road in DP548914 Entered 13th August 1971 REGISTRAR GENERAL				

12-5-71 DP54891

DP548914

SECOND SCHEDULE (continued)

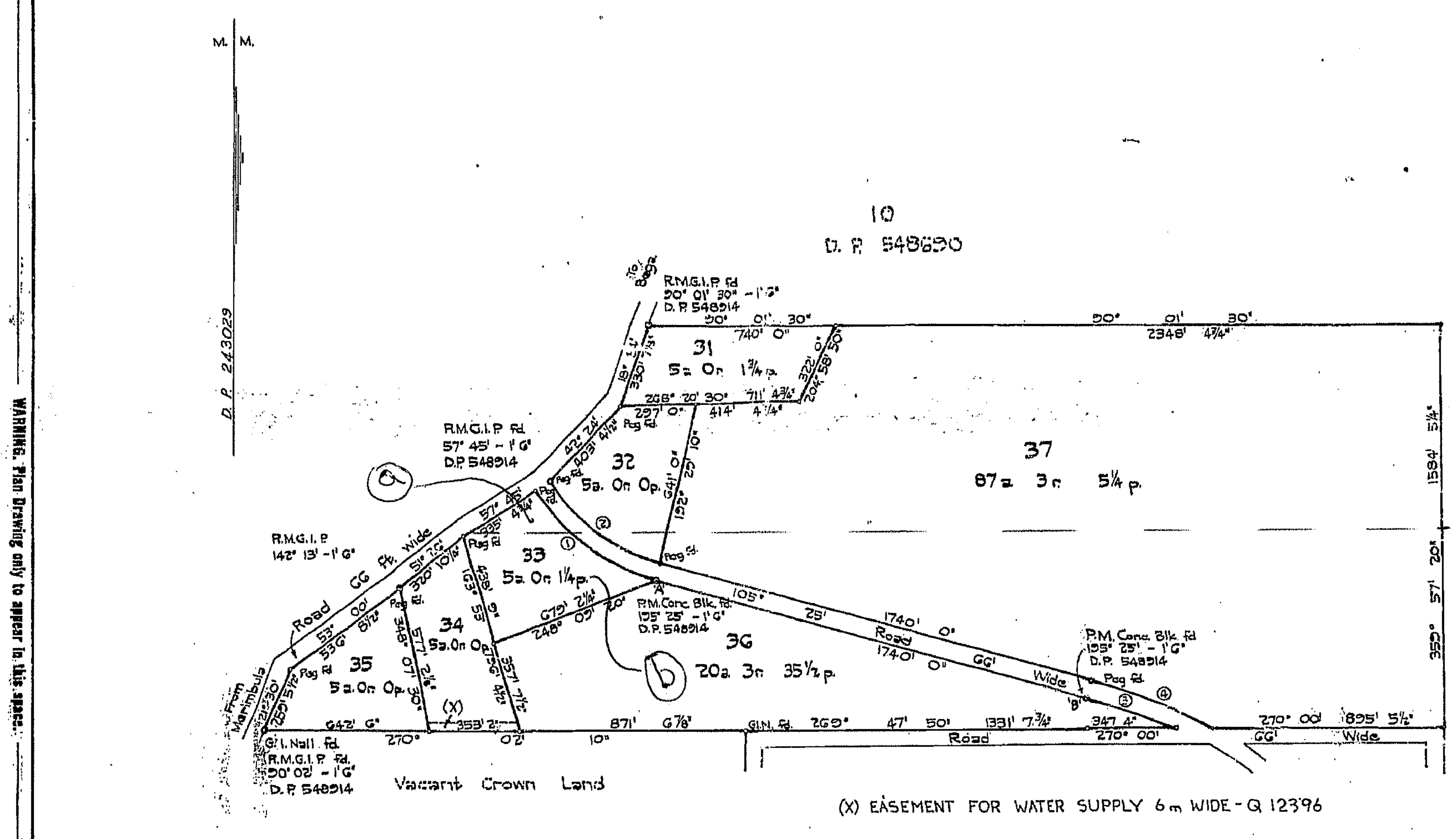
INSTRUMENT NATURE	NUMBER	DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION

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

Plan Form 2—This form must NOT be used where it is intended to dedicate public roads or public reserves or create drainage reserves, easements, or restrictions as to user—See Form 3.

DP243029

WARNING. CREASING OR FOLDING WILL LEAD TO REJECTION.



(X) EASEMENT FOR WATER SUPPLY 6m WIDE - Q 12396

SCHEDULE OF CURVED BOUNDARIES

Nº	RADIUS	ARC	CHORD	
1	808' 0"	597' 0"	126° 35'	583' 6⅞"
2	742' 0"	548' 2¾"	300° 35'	535' 10¼"
3	1967' 0"	366' 3¼"	110° 45'	365' 9"
4	2033' 0"	505' 4½"	292° 32' 20"	504' 1"

WARNING. Plan Drawing only to appear in this space.

M.P.D.

SURVEYOR'S REFERENCE.

OFFICE USE ONLY.

D. P. 243029

Registered: 22. 6. 1972

C.A.: Nº 3/72 OF 17-4-1972

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: PARISH

Last Plan: D. P. 242168
D. P. 548914

PLAN OF SUBDIVISION OF LOTS 101 & 102, D.P. 548914 AND LOT 1, D.P. 242166

Scale: 400 Feet to an Inch

Mun./Shire ~~City~~: Imlay

Locality: Merimbula

Parish: Bournda

County: Auckland

~~This is sheet 1 of my plan in ... sheets~~
Delete if inapplicable.

I, Michael Bell of 4 Church St. Greenwich a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made *(1) by me (2) ~~under my immediate supervision~~ in accordance with the Survey Practice Regulations, 1933, and was completed on 6th April, 1972.

Signature: Michael Bell

Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth: A - B
*Strike out either (1) or (2). Insert date of survey.

Council Clerk's Certificate.

I hereby certify that—
(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and
*(b) ~~the requirements of section 3?? of the Metropolitan Water, Sewerage, and Drainage Act, 1924, as amended, [Hunter District Water, Sewerage, and Drainage Act, 1938, as amended]~~
have been complied with by the applicant in relation to the proposed Subdivision (insert "new road" or "subdivision") set out herein.

Subdivision No. 3/72

Date 17-4-1972

(Signature) W. G. Driff
Council Clerk.

*This part of certificate to be deleted where the application is only for the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board. [Delete if inapplicable.

PLAN No. 329

AMENDMENTS AND/OR ADDITIONS NOTED ON PLAN IN REGISTRAR GENERAL'S OFFICE.

I, Bruce Richard Davies, Under Secretary for Lands and Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 17th day of October, 1980

D.P. 243029

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 243029

FEET	INCHES	METRES
1	6	0.455
17	4 3/4	5.3
66	-	20.115
259	5 1/2	79.08
297	-	90.53
320	10 1/4	97.9
322	-	98.15
330	7 1/8	100.76
335	4 3/4	102.23
347	4	105.87
353	2	107.65
357	7 1/2	109
365	9	111.48
366	3 1/4	111.64
379	2 1/4	115.58
403	4 1/2	122.95
414	4 3/4	126.31
438	9	133.73
504	1	153.64
505	4 1/2	154.04
535	10 1/4	163.33
536	8 1/2	163.59
548	2 3/4	167.1
577	2 1/8	175.92
583	6 1/8	177.85
597	-	181.97
640	-	195.07
641	-	195.38
642	6	195.83
679	2 1/4	207.02
711	4 3/4	216.83
740	-	225.55
742	-	226.16
796	4 1/2	242.74
808	-	246.28
871	6 7/8	265.66
895	5 1/2	272.94
1331	7 3/4	405.89
1584	5 1/4	482.94
1740	-	530.4
1967	-	599.5
2033	-	619.7
2348	4 3/4	715.8

AC	RD	P	HA
5	-	-	2.023
5	-	1 1/4	2.026
5	-	1 3/4	2.028
20	3	35 1/2	8.487
87	3	5 1/4	35.52

1

f:p /Src:T

Section 149 Certificates

bega valley shire council

PO Box 492, Bega NSW 2550
P. (02) 6499 2222
F. (02) 6499 2200
E. council@begavalley.nsw.gov.au

ABN. 26 987 935 332
DX. 4904 Bega

Planning certificate under Section 149(2) Environmental Planning and Assessment Act 1979

Applicant: V Boggaram

PO Box 976

NORTH RYDE BC NSW 1670

Certificate No: 11765 **Receipt No:** 749277

Certificate Date: 28/08/2015 **Applicant's Ref:**

Property: Sapphire Coast Drive TURA BEACH 2548

Description: Lot: 34 DP: 243029 **Parcel No:** 5900

In accordance with the requirements of section 149(2) of the *Environmental Planning and Assessment Act 1979*, the following prescribed matters relate to the land at the date of this certificate.

---

1 Names of relevant planning instruments and DCPs that apply to the carrying out of development on the land

(a) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Bega Valley Local Environmental Plan 2002
State Environmental Planning Policy No. 1 - Development Standards
State Environmental Planning Policy No. 4 - Development Without Consent and Miscellaneous Exempt and Complying Development
State Environmental Planning Policy No. 6 - Number of Storeys in a Building
State Environmental Planning Policy No. 15 - Rural Land-Sharing Communities
State Environmental Planning Policy No. 21 - Caravan Parks
State Environmental Planning Policy No. 22 - Shops and Commercial Premises
State Environmental Planning Policy No. 26 – Littoral Rainforests
State Environmental Planning Policy No. 30 - Intensive Agriculture
State Environmental Planning Policy No. 32 - Urban Consolidation (Re-Development of Urban Land)
State Environmental Planning Policy No. 33 - Hazardous and Offensive Development
State Environmental Planning Policy No. 36 - Manufactured Home Estates

149 (2) certificate

State Environmental Planning Policy No. 44 - Koala Habitat Protection
State Environmental Planning Policy No. 50 - Canal Estate
State Environmental Planning Policy No. 55 - Remediation of Land
State Environmental Planning Policy No. 60 – Exempt and Complying Development
State Environmental Planning Policy No. 62 - Sustainable Aquaculture
State Environmental Planning Policy No. 64 - Advertising Signs
State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development
State Environmental Planning Policy (Affordable Rental Housing) 2009
State Environmental Planning Policy (Building Sustainability Index: BASIX 2004)
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Major Development) 2005
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy (Rural Lands) 2008
State Environmental Planning Policy (State and Regional Development) 2011
State Environmental Planning Policy (Temporary Structures) 2007

(b) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the *Environmental Planning and Assessment Act 1979* (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).
Draft State Environmental Planning Policy (Application of Development Standards) 2004
Draft State Environmental Planning Policy No. 66 - Integration of Land Use and Transport
Draft State Environmental Planning Policy (Competition) 2010
Bega Valley Local Environmental Plan 2013

(c) The name of each development control plan that applies to the carrying out of development on the land.

Bega Valley Development Control Plan 2013

In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2 Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone:

a) The identity of the zone

Zone 1(c) Rural Small Holdings Zone

b) The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent

Development for the purpose of: agriculture; environmental facilities

c) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent

Development for the purpose of: animal establishments; aquaculture; attached dual occupancies; bed and breakfast establishments; child care centres; clearing of land; community facilities; craft studios; detached dual occupancies; dwelling houses; bed and breakfast establishments; child care centres; clearing of land; community facilities; craft studios; detached dual occupancies; dwelling house, educational establishments; farm forestry; granny flats; home businesses; home industries; intensive horticulture; places of public worship; professional consulting rooms; reception establishments; recreation areas; recreation establishments; retail plant nurseries; riding schools; tourist accommodation; utility installations; veterinary establishments

d) The purposes for which the instrument provides that development is prohibited within the zone

Any development not included in subclause (b) or (c)

e) Are there any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land.

Yes, the dimension for a dwelling is 5000 sqm. See Clause 19 of the Bega Valley Local Environmental Plan 2002.

(f) Does the land include or comprise critical habitat?
Council does not have any notification of where critical habitat is located within the Bega Valley Shire. Council is aware that a number of endangered species and endangered ecological communities do exist in the Shire. It is strongly recommended that the purchaser make their own enquiries with regard to critical habitat.

(g) Is the land in a conservation area?
No, the land is not in a conservation area.

(h) Is an item of environmental heritage situated on the land?
No, an item of environmental heritage is not situated on the land.

3 Complying development

Is the land, land on which complying development may be carried out under each of the codes for complying development because of the provisions of 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*? If complying development may not be carried out on that land because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of that Policy, what are the reasons why it may not be carried out?

(a) General Housing Code

Yes. Complying development under the General Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(b) Housing Alterations Code

Yes. Complying development under the Housing Internal Alterations Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(c) General Commercial and Industrial Code

Yes. Complying development under the General Commercial and Industrial Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(d) Subdivision Code

Yes. Complying development under the Subdivisions Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(e) Rural Housing Code

Yes. Complying development under the Rural Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(f) General Development Code

Yes. Complying development under the General Development Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(g) Demolition Code

Yes. Complying development under the Demolition Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

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

Yes. Complying development under the Commercial and Industrial (New Buildings and Alterations) Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(i) Fire Safety Code

Yes. Complying development under the Fire Safety Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

4 Coastal protection

To the extent that the council has been notified by the Department of Services, Technology and Information, is the land affected by the operation of section 38 or 39 of the *Coastal Protection Act 1979*?

No, the land is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

4A Information relating to beaches and coasts

(1) Has an order been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of the act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with?
No.

(2) (a) Has the Council been notified under section 55X of the *Coastal Protection Act 1979* that emergency coastal protection works (within the meaning of the act) have been placed on the land (or on public land adjacent to that land)?

No works have been placed on the land.

(2) (b) If works have been so placed, is Council satisfied that the works have been removed and the land restored in accordance with the Act?

No.

4B Annual charges for coastal protection services under *Local Government Act 1993*

Has the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the *Local Government Act 1993*.

No.

5 Mine subsidence

Is the land proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act 1961*?

No, the land is not within an area proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 Road widening and road realignment

Is the land affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the *Roads Act 1993*, or

No

(b) any environmental planning instrument, or

No

(c) any resolution of the council?

No

7 Council and other public authority policies on hazard risk restrictions

(a) Is the land affected by a policy adopted by the council that restricts the development of the land because of the likelihood of:

(i) land slip

No

(ii) bushfire

No

(iii) tidal inundation

No

(iv) subsidence

No

(v) acid sulphate soils

No

(vi) coastal hazard

(vii) any other risk (other than flooding)

Yes, Development in Flight Paths - Clause 6.8 of Bega Valley Local Environmental Plan 2013 applies.

Note: The fact that the subject land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.

(b) Is the land 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:

(i) land slip

No

(ii) bushfire

Yes, the subject land, or part of the subject land, is bushfire prone land. Please make separate enquiries to Council about planning and development controls that may apply to this land under the Rural Fires and Environmental Assessment Legislation Amendment Act 2002 (NOTE: The Act requires Councils to specify land that is identified as Bushfire Prone Land on Bushfire Prone Land Maps certified by the Commissioner, NSW Rural Fire Service. These maps are available for inspection at Council's Bega Office, Zingel Place, Bega)

(iii) tidal inundation

No

(iv) subsidence

No

(v) acid sulphate soils

No

(vi) coastal hazard

No

(vii) any other risk (other than flooding)

No

Note: The fact that the subject land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.

7A Flood related development controls information

(a) Is development on the 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 subject to flood related development controls?

No (However it is strongly recommended that the purchaser make their own enquiries in regard to flooding).

(b) Is development on that land or part of the land for any other purpose is subject to flood related development controls?

No (However it is strongly recommended that the purchaser make their own enquiries in regard to flooding).

Note: Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006

8 Land reserved for acquisition

Does any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 make provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the *Environmental Planning and Assessment Act 1979*?

No, an environmental planning instrument or proposed environmental planning instrument referred to in clause 1 does not make provision in relation to the acquisition of the land by a public authority.

9 Contributions plans

The name of each contribution plan applying to the land

Bega Valley Section 94 & 94A Contribution Plan 2014
Bega Valley Shire Council Development Servicing Plan for Sewerage February 2013
Bega Valley Shire Council Development Servicing Plan for Water February 2013

Procedure 4.07.5 'Water Supply & Sewerage Section 64 Charges' applies to all vacant allotments and developed allotments within areas mapped in the current Bega Valley Water Supply and Sewer Development Servicing Plans. You can view this on Council's website at www.begavalley.nsw.gov.au under the heading Your Council. As this lot may be affected by this Procedure, any prospective purchaser is strongly advised to read the document to be fully aware of its implications prior to purchase.

9A Biodiversity certified land

Is the land biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*)?

No

10 Biobanking agreements

To the extent that the council has been notified by the Director-General of the Department of Environment, Climate Change and Water, is the land affected by a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995*?

No, the land is not affected by a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995, but only to the extent that Council has been notified by the Director-General of the Department of Environment, Climate Change and Water.

11 Bush fire prone land

Is any of the land bush fire prone land (as defined in the *Environmental Planning and Assessment Act 1979*)?

See question 7 (a)(ii) and (b)(ii)

12 Property vegetation plans

Has council been notified whether the land is land to which a property vegetation plan under the *Native Vegetation Act 2003* applies?

No, Council has not been notified of the existence of a property vegetation plan.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Has council been notified whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land?

No, Council has not been notified of an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14 Directions under Part 3A

Is there a direction by the Minister in force under section 75P (2) (c1) of the *Environmental Planning and Assessment Act 1979* that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the *Environmental Planning and Assessment Act 1979* does not have effect?

No, Council is not aware of a direction by the Minister that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Environmental Planning and Assessment Act 1979 does not have effect.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* applies:
Has a current site compatibility certificate (seniors housing), of which the council is aware, been issued under clause 25 of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued.

16 Site compatibility certificates for infrastructure

Has a valid site compatibility certificate (infrastructure), of which the council is aware, been issued under clause 19 of *State Environmental Planning Policy (Infrastructure) 2007* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued

17 Site compatibility certificates and conditions for affordable rental housing

Has a current site compatibility certificate (affordable rental housing), of which the council is aware, been issued under clause 37 of *State Environmental Planning Policy (Affordable Rental Housing) 2009* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued

18 Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

No

(2) The date of any subdivision order that applies to the land.

No

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

No

19 Site verification certificates

Has a current site verification certificate of which the council is aware, been issued under clause Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 in respect of the land?

No

NOTE:

Note: The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997:

(a) Is the land (or part of the land) significantly contaminated land with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(b) Is the land subject to a management order within the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(c) Is the land the subject of an approved voluntary management proposal with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(d) Is the land subject to an ongoing maintenance order with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(e) Is the land subject of a site audit statement that has been provided to the Council within the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

NOTE:

Has the Council been provided with a copy of any exemption or authorisation by the Co-ordinator General under section 23 or authorisation under section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 in relation to the land?

No

CAUTION:

The absence of any reference to a matter affecting the land shall not imply that the land is not affected by that matter not referenced in this certificate.

Information provided under section 149(2) is in accordance with the matters prescribed under schedule 4 of the *Environmental Planning and Assessment Regulation 2000* and is provided only to the extent that the Council has been notified by the Department of Public Works or Department of Planning.

Should any additional information be required, please contact Council's Customer Service and Administration section to obtain the procedure and cost of the relevant development or planning enquiry.

Purchasers of rural land become responsible for control of any noxious weeds and may wish to negotiate the cost of controlling any existing infestations with the vendor. Prospective purchasers of rural land should seek an inspection and report by way of separate application to Council's Noxious Weeds Department. A fee for this service is applicable and available through Council's Fees and Charges schedule.

bega valley shire council

PO Box 492, Bega NSW 2550
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F. (02) 6499 2200
E. council@begavalley.nsw.gov.au

ABN. 26 987 935 332
DX. 4904 Bega

Planning certificate under Section 149(5) Environmental Planning and Assessment Act 1979

Applicant: V Boggaram

PO Box 976

NORTH RYDE BC NSW 1670

Certificate No:	11766	**Receipt No:**	749277
Certificate Date:	28/08/2015	**Applicant's Ref:**	

Property: Sapphire Coast Drive TURA BEACH 2548

Description: Lot: 34 DP: 243029 **Parcel No:** 5900

In accordance with the requirements of section 149(5) of the *Environmental Planning and Assessment Act 1979*, the following prescribed matters relate to the land at the date of this certificate.

1 Is the land affected by a tree preservation order?

No

2 The following development consent has been granted by Council within the previous five years.

None

3 Has any development consent with respect to the subject land been granted by the Minister for Planning?

No

149 (5) certificate

4 Does any order under the Heritage Act 1977 affect the land?

No

5 Does the subject land contain land that is classified as being steep? That is, it has a gradient of equal or greater than 15% or 7.5°.

No

6 Does the subject land fall within an extractive industry buffer?

No

7 Is the subject land located within 100 metres of an item of environmental heritage?

No

8 Other advice

No

CAUTION:

The absence of any reference to a matter affecting the land shall not imply that the land is not affected by that matter not referenced in this certificate.

When advice in accordance with Section 149(5) of the *Environmental Planning and Assessment Act 1979*, (the Act) is requested the Council is under no obligation to furnish any advice. If advice is provided, Council draws your attention to section 149(6) and section 145B of the Act which have the effect that the Council shall not incur any liability in respect of advice provided in good faith pursuant to section 149(5), including the furnishing of advice in respect of contaminated land.

Should any additional information be required, please contact Council's Customer Service and Administration section to obtain the procedure and cost of the relevant development or planning enquiry.

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DX. 4904 Bega

Planning certificate under Section 149(2) Environmental Planning and Assessment Act 1979

Applicant: V Boggaram

PO Box 976

NORTH RYDE BC NSW 1670

Certificate No: 11767 **Receipt No:** 749277

Certificate Date: 28/08/2015 **Applicant's Ref:**

Property: 2B Sapphire Coast Drive TURA BEACH 2548

Description: Lot: 33 DP: 243029 **Parcel No:** 5901

In accordance with the requirements of section 149(2) of the *Environmental Planning and Assessment Act 1979*, the following prescribed matters relate to the land at the date of this certificate.

---

1 Names of relevant planning instruments and DCPs that apply to the carrying out of development on the land

(a) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Bega Valley Local Environmental Plan 2002
State Environmental Planning Policy No. 1 - Development Standards
State Environmental Planning Policy No. 4 - Development Without Consent and Miscellaneous Exempt and Complying Development
State Environmental Planning Policy No. 6 - Number of Storeys in a Building
State Environmental Planning Policy No. 15 - Rural Land-Sharing Communities
State Environmental Planning Policy No. 21 - Caravan Parks
State Environmental Planning Policy No. 22 - Shops and Commercial Premises
State Environmental Planning Policy No. 26 – Littoral Rainforests
State Environmental Planning Policy No. 30 - Intensive Agriculture
State Environmental Planning Policy No. 32 - Urban Consolidation (Re-Development of Urban Land)
State Environmental Planning Policy No. 33 - Hazardous and Offensive Development
State Environmental Planning Policy No. 36 - Manufactured Home Estates

149 (2) certificate

State Environmental Planning Policy No. 44 - Koala Habitat Protection
State Environmental Planning Policy No. 50 - Canal Estate
State Environmental Planning Policy No. 55 - Remediation of Land
State Environmental Planning Policy No. 60 – Exempt and Complying Development
State Environmental Planning Policy No. 62 - Sustainable Aquaculture
State Environmental Planning Policy No. 64 - Advertising Signs
State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development
State Environmental Planning Policy (Affordable Rental Housing) 2009
State Environmental Planning Policy (Building Sustainability Index: BASIX 2004)
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Major Development) 2005
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy (Rural Lands) 2008
State Environmental Planning Policy (State and Regional Development) 2011
State Environmental Planning Policy (Temporary Structures) 2007

(b) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the *Environmental Planning and Assessment Act 1979* (unless the Director-General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).
Draft State Environmental Planning Policy (Application of Development Standards) 2004
Draft State Environmental Planning Policy No. 66 - Integration of Land Use and Transport
Draft State Environmental Planning Policy (Competition) 2010
Bega Valley Local Environmental Plan 2013

(c) The name of each development control plan that applies to the carrying out of development on the land.

Bega Valley Development Control Plan 2013

In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2 Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone:

a) The identity of the zone

Zone 1(c) Rural Small Holdings Zone

b) The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent

Development for the purpose of: agriculture; environmental facilities

c) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent

Development for the purpose of: animal establishments; aquaculture; attached dual occupancies; bed and breakfast establishments; child care centres; clearing of land; community facilities; craft studios; detached dual occupancies; dwelling houses; bed and breakfast establishments; child care centres; clearing of land; community facilities; craft studios; detached dual occupancies; dwelling house, educational establishments; farm forestry; granny flats; home businesses; home industries; intensive horticulture; places of public worship; professional consulting rooms; reception establishments; recreation areas; recreation establishments; retail plant nurseries; riding schools; tourist accommodation; utility installations; veterinary establishments

d) The purposes for which the instrument provides that development is prohibited within the zone

Any development not included in subclause (b) or (c)

e) Are there any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land.

Yes, the dimension for a dwelling is 5000 sqm. See Clause 19 of the Bega Valley Local Environmental Plan 2002.

(f) Does the land include or comprise critical habitat?

Council does not have any notification of where critical habitat is located within the Bega Valley Shire. Council is aware that a number of endangered species and endangered ecological communities do exist in the Shire. It is strongly recommended that the purchaser make their own enquiries with regard to critical habitat.

(g) Is the land in a conservation area?
No, the land is not in a conservation area.

(h) Is an item of environmental heritage situated on the land?
No, an item of environmental heritage is not situated on the land.

3 Complying development

Is the land, land on which complying development may be carried out under each of the codes for complying development because of the provisions of 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*? If complying development may not be carried out on that land because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of that Policy, what are the reasons why it may not be carried out?

(a) General Housing Code

Yes. Complying development under the General Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(b) Housing Alterations Code

Yes. Complying development under the Housing Internal Alterations Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(c) General Commercial and Industrial Code

Yes. Complying development under the General Commercial and Industrial Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(d) Subdivision Code

Yes. Complying development under the Subdivisions Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(e) Rural Housing Code

Yes. Complying development under the Rural Housing Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(f) General Development Code

Yes. Complying development under the General Development Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(g) Demolition Code

Yes. Complying development under the Demolition Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

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

Yes. Complying development under the Commercial and Industrial (New Buildings and Alterations) Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

(i) Fire Safety Code

Yes. Complying development under the Fire Safety Code in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 may be carried out on this land.

4 Coastal protection

To the extent that the council has been notified by the Department of Services, Technology and Information, is the land affected by the operation of section 38 or 39 of the *Coastal Protection Act 1979*?

No, the land is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Public Works.

4A Information relating to beaches and coasts

(1) Has an order been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of the act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with?
No.

(2) (a) Has the Council been notified under section 55X of the *Coastal Protection Act 1979* that emergency coastal protection works (within the meaning of the act) have been placed on the land (or on public land adjacent to that land)?

No works have been placed on the land.

(2) (b) If works have been so placed, is Council satisfied that the works have been removed and the land restored in accordance with the Act?

No.

4B Annual charges for coastal protection services under *Local Government Act 1993*

Has the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).
Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the *Local Government Act 1993*.

No.

5 Mine subsidence

Is the land proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act 1961*?

No, the land is not within an area proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 Road widening and road realignment

Is the land affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the *Roads Act 1993*, or

No

(b) any environmental planning instrument, or

No

(c) any resolution of the council?

No

7 Council and other public authority policies on hazard risk restrictions

(a) Is the land affected by a policy adopted by the council that restricts the development of the land because of the likelihood of:

(i) land slip

No

(ii) bushfire

No

(iii) tidal inundation

No

(iv) subsidence

No

(v) acid sulphate soils

No

(vi) coastal hazard

(vii) any other risk (other than flooding)

Yes, Development in Flight Paths - Clause 6.8 of Bega Valley Local Environmental Plan 2013 applies.

Note: The fact that the subject land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.

(b) Is the land 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:

(i) land slip

No

(ii) bushfire

Yes, the subject land, or part of the subject land, is bushfire prone land. Please make separate enquiries to Council about planning and development controls that may apply to this land under the Rural Fires and Environmental Assessment Legislation Amendment Act 2002 (NOTE: The Act requires Councils to specify land that is identified as Bushfire Prone Land on Bushfire Prone Land Maps certified by the Commissioner, NSW Rural Fire Service. These maps are available for inspection at Council's Bega Office, Zingel Place, Bega)

(iii) tidal inundation

No

(iv) subsidence

No

(v) acid sulphate soils

No

(vi) coastal hazard

No
(vii) any other risk (other than flooding)

No

Note: The fact that the subject land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.

7A Flood related development controls information

(a) Is development on the 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 subject to flood related development controls?

No (However it is strongly recommended that the purchaser make their own enquiries in regard to flooding).

(b) Is development on that land or part of the land for any other purpose is subject to flood related development controls?

No (However it is strongly recommended that the purchaser make their own enquiries in regard to flooding).

Note: Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006

8 Land reserved for acquisition

Does any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 make provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the *Environmental Planning and Assessment Act 1979*?

No, an environmental planning instrument or proposed environmental planning instrument referred to in clause 1 does not make provision in relation to the acquisition of the land by a public authority.

9 Contributions plans

The name of each contribution plan applying to the land

Bega Valley Section 94 & 94A Contribution Plan 2014
Bega Valley Shire Council Development Servicing Plan for Sewerage February 2013
Bega Valley Shire Council Development Servicing Plan for Water February 2013

Procedure 4.07.5 'Water Supply & Sewerage Section 64 Charges' applies to all vacant allotments and developed allotments within areas mapped in the current Bega Valley Water Supply and Sewer Development Servicing Plans. You can view this on Council's website at www.begavalley.nsw.gov.au under the heading Your Council. As this lot may be affected by this Procedure, any prospective purchaser is strongly advised to read the document to be fully aware of its implications prior to purchase.

9A Biodiversity certified land

Is the land biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*)?

No

10 Biobanking agreements

To the extent that the council has been notified by the Director-General of the Department of Environment, Climate Change and Water, is the land affected by a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995*?

No, the land is not affected by a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995, but only to the extent that Council has been notified by the Director-General of the Department of Environment, Climate Change and Water.

11 Bush fire prone land

Is any of the land bush fire prone land (as defined in the *Environmental Planning and Assessment Act 1979*)?

See question 7 (a)(ii) and (b)(ii)

12 Property vegetation plans

Has council been notified whether the land is land to which a property vegetation plan under the *Native Vegetation Act 2003* applies?

No, Council has not been notified of the existence of a property vegetation plan.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Has council been notified whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land?

No, Council has not been notified of an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14 Directions under Part 3A

Is there a direction by the Minister in force under section 75P (2) (c1) of the *Environmental Planning and Assessment Act 1979* that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the *Environmental Planning and Assessment Act 1979* does not have effect?

No, Council is not aware of a direction by the Minister that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Environmental Planning and Assessment Act 1979 does not have effect.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* applies:
Has a current site compatibility certificate (seniors housing), of which the council is aware, been issued under clause 25 of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued.

16 Site compatibility certificates for infrastructure

Has a valid site compatibility certificate (infrastructure), of which the council is aware, been issued under clause 19 of *State Environmental Planning Policy (Infrastructure) 2007* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued

17 Site compatibility certificates and conditions for affordable rental housing

Has a current site compatibility certificate (affordable rental housing), of which the council is aware, been issued under clause 37 of *State Environmental Planning Policy (Affordable Rental Housing) 2009* in respect of proposed development on the land?

No, Council is not aware of a current site compatibility statement being issued

18 Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

No

(2) The date of any subdivision order that applies to the land.

No

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

No

19 Site verification certificates

Has a current site verification certificate of which the council is aware, been issued under clause Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 in respect of the land?

No

NOTE:

Note: The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997:

(a) Is the land (or part of the land) significantly contaminated land with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(b) Is the land subject to a management order within the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(c) Is the land the subject of an approved voluntary management proposal with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(d) Is the land subject to an ongoing maintenance order with the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

(e) Is the land subject of a site audit statement that has been provided to the Council within the meaning of the Contaminated Land Management Act 1997 at the date of this certificate?

No

NOTE:

Has the Council been provided with a copy of any exemption or authorisation by the Co-ordinator General under section 23 or authorisation under section 24 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 in relation to the land?

No

CAUTION:

The absence of any reference to a matter affecting the land shall not imply that the land is not affected by that matter not referenced in this certificate.

Information provided under section 149(2) is in accordance with the matters prescribed under schedule 4 of the *Environmental Planning and Assessment Regulation 2000* and is provided only to the extent that the Council has been notified by the Department of Public Works or Department of Planning.

Should any additional information be required, please contact Council's Customer Service and Administration section to obtain the procedure and cost of the relevant development or planning enquiry.

Purchasers of rural land become responsible for control of any noxious weeds and may wish to negotiate the cost of controlling any existing infestations with the vendor. Prospective purchasers of rural land should seek an inspection and report by way of separate application to Council's Noxious Weeds Department. A fee for this service is applicable and available through Council's Fees and Charges schedule.

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Planning certificate under Section 149(5) Environmental Planning and Assessment Act 1979

Applicant: V Boggaram

PO Box 976

NORTH RYDE BC NSW 1670

Certificate No:	11768	**Receipt No:**	749277
Certificate Date:	28/08/2015	**Applicant's Ref:**	

Property: 2B Sapphire Coast Drive TURA BEACH 2548

Description: Lot: 33 DP: 243029 **Parcel No:** 5901

In accordance with the requirements of section 149(5) of the *Environmental Planning and Assessment Act 1979*, the following prescribed matters relate to the land at the date of this certificate.

---

1 Is the land affected by a tree preservation order?

No

2 The following development consent has been granted by Council within the previous five years.

None

3 Has any development consent with respect to the subject land been granted by the Minister for Planning?

No

149 (5) certificate

4 Does any order under the Heritage Act 1977 affect the land?

No

5 Does the subject land contain land that is classified as being steep? That is, it has a gradient of equal or greater than 15% or 7.5°.

No

6 Does the subject land fall within an extractive industry buffer?

No

7 Is the subject land located within 100 metres of an item of environmental heritage?

No

8 Other advice

No

CAUTION:

The absence of any reference to a matter affecting the land shall not imply that the land is not affected by that matter not referenced in this certificate.

When advice in accordance with Section 149(5) of the *Environmental Planning and Assessment Act 1979*, (the Act) is requested the Council is under no obligation to furnish any advice. If advice is provided, Council draws your attention to section 149(6) and section 145B of the Act which have the effect that the Council shall not incur any liability in respect of advice provided in good faith pursuant to section 149(5), including the furnishing of advice in respect of contaminated land.

Should any additional information be required, please contact Council's Customer Service and Administration section to obtain the procedure and cost of the relevant development or planning enquiry.

NSW WorkCover Records

√B

10 SEP 2015

WorkCover NSW
92–100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
Customer Service Centre 13 10 50
DX 731 Sydney workcover.nsw.gov.au

NSW GOVERNMENT WorkCover

Our Ref: D15/143616
Your Ref: Vittal Boggaram

7 September 2015

Attention: Vittal Boggaram
Environmental Investigation Services
PO BOX 976
North Ryde BC NSW 1670

Dear Mr Boggaram,

RE SITE: Lots 33 & 34 DP 243029 Tura Beach Rd Tura Beach NSW

I refer to your site search request received by WorkCover NSW on 1 September 2015 requesting information on licences to keep dangerous goods for the above site.

A search of the Stored Chemical Information Database (SCID) and the microfiche records held by WorkCover NSW has not located any records pertaining to the above mentioned premises.

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely

Brent Jones
Senior Licensing Officer
Dangerous Goods Team

Appendix D: Borehole Logs

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. **1** 1/1

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 123.3m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL/TOPSOIL: Silty sand, fine to coarse grained, dark grey, trace of fine to medium grained quartz gravel and ash.	M			
								GP		M	MD		
					N = 13 1,5,8	1			CLAYEY GRAVELLY SAND: fine to coarse grained, orange brown, fine to medium grained sub rounded to rounded quartz gravel, trace of ash.				
					N = SPT 9/150mm REFUSAL	2		-	SANDSTONE: fine to coarse grained, light grey, red brown and orange brown.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW 'TC' BIT RESISTANCE
					N = SPT 9/100mm REFUSAL	3			END OF BOREHOLE AT 3.1m			>600	
						4							
						5							
						6							
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. **2** 1/1

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 122.0m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL/TOPSOIL: Silty sand, fine to coarse grained, dark grey, trace of root fibres.	M			GRASS COVER
AFTER 45 MINS ▼ ON COMPLETION					N = 2 1,0,2			CL	SILTY SAND: fine to coarse grained, light brown, trace of fine grained rounded quartz gravel.	W	VL		
						1			SANDY CLAY: medium plasticity, orange brown and red brown, fine to coarse grained sand, trace of fine grained rounded quartz gravel.	MC>PL	H		
					N = 17 5,7,10					MC≈PL		>600	SAMPLE FRIABLE
						2			as above, but with fine grained rounded quartz gravel.				
					N = SPT 14/150mm/ REFUSAL	3			END OF BOREHOLE AT 3.15m				
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. **3** 1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 119.5m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL/TOPSOIL: Silty sand, fine to coarse grained, grey, trace of root fibres.	M			GRASS COVER
								CL		MC>PL			
▼ AFTER 2.5 HOURS					N = 15 2,6,9				SANDY CLAY: medium plasticity, orange brown and red brown, fine to coarse grained sand, trace of fine grained rounded quartz gravel.		VSt-H	180 250 500	
						1							
									as above, but without quartz gravel.	MC<PL	H		EXTREMELY LOW 'TC' BIT RESISTANCE
▼ ON COMPLET-ION					N = 19 6,8,11							>600 >600 >600	
						2							
									as above, but light grey, red brown and light orange brown.				
					N = 23 5,8,15	3						320 350 470	
								-	SANDSTONE: fine to coarse grained, light grey, red brown and light orange brown.	XW	EL		EXTREMELY LOW TO VERY LOW RESISTANCE
						4							
					N = 23 6,9,14								SAMPLE TOO FRIABLE FOR HP TESTING
						5							
									SANDSTONE: fine to coarse grained, orange brown.				
					N = SPT 11/150mm REFUSAL	6							
						7							

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BOREHOLE LOG

Borehole No. **3** 2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 119.5m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
				■					SANDSTONE: fine to coarse grained, orange brown.	XW	EL		
									END OF BOREHOLE AT 7.5m				
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 4
1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15
Method: SPIRAL AUGER JK300
Logged/Checked by: M.W./W.T.
R.L. Surface: ≈ 115.6m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION & AFTER 3.75 HRS	■					0			FILL/TOPSOIL: Silty sand, fine to coarse grained, grey, trace of root fibres.	M			GRASS COVER
								SC	CLAYEY SAND: fine to coarse grained, orange brown and light brown, with fine grained rounded quartz gravel and cemented bands.	M	VL		
	■			■	N = 3 2,1,2	1							
									CLAYEY SAND: fine to coarse grained, orange brown, trace of fine grained rounded quartz gravel.		MD		
				■	N = 26 3,12,14	2							
									CLAYEY SAND: fine to medium grained, orange brown and red brown, with fine grained rounded quartz gravel.		D		EXTREMELY LOW 'TC' BT RESISTANCE
				■	N = 34 15,16,18	3							
						4							
				■	N > 9 14,9/50mm REFUSAL	5							
						6		-	SANDSTONE: fine to coarse grained, light grey, with fine grained rounded quartz clasts.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW RESISTANCE
				■	N > 21 9,12,8/ 50mm REFUSAL	7							

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BOREHOLE LOG

Borehole No. 4
2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15

Method: SPIRAL AUGER
JK300

R.L. Surface: ≈ 115.6m
Datum: AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
				■					SANDSTONE: fine to coarse grained, light grey, with fine grained rounded quartz clasts.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW RESISTANCE
									END OF BOREHOLE AT 7.5m				

8
9
10
11
12
13
14

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BOREHOLE LOG

Borehole No. 5
1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15
Method: SPIRAL AUGER JK300
Logged/Checked by: M.W./W.T.
R.L. Surface: ≈ 116.9m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					0			FILL/TOPSOIL: Silty sand, fine to coarse grained, dark grey, trace of root fibres.	M			GRASS COVER
								SP		M	L		
	■			■	N = 4 2,1,3			SC	SAND: fine to coarse grained, light grey.				
						1			CLAYEY SAND: fine to coarse grained, orange brown, trace of fine grained rounded quartz gravel.				
									CLAYEY SAND: fine to coarse grained, light grey, red brown and orange brown, trace of fine grained rounded quartz gravel and XW sandstone bands.		L-MD		
				■	N > 6 14,6/50mm REFUSAL	2							
								CL	SANDY CLAY: medium plasticity, light grey, red brown and orange brown, fine to coarse grained sand, trace of fine grained rounded quartz gravel and fine grained sub rounded to sub angular ironstone gravel.	MC>PL	VSt-H		
				■	N = 26 10,13,13	3						420 240 300	
						4				MC<PL	H		EXTREMELY LOW 'TC' BIT RESISTANCE
				■	N > 26 10,11, 15/100mm REFUSAL	5						580 600 >600	
						6			SANDY CLAY: medium plasticity, light grey, fine to coarse grained sand, trace of fine grained quartz gravel.			>600 >600 >600	
				■	N = 26 9,12,14								
						7							

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BOREHOLE LOG

Borehole No. **5** 2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 116.9m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
AFTER 4.75 HOURS ▼								CL	SANDY CLAY: medium plasticity, light grey, fine to coarse grained sand, trace of fine grained quartz gravel.	MC<PL	H		
								-	SANDSTONE: fine to coarse grained, orange brown, with fine grained quartz gravel.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW RESISTANCE
▼ ON COMPLET-ION				■		8							
						9			END OF BOREHOLE AT 9.0m				SPT REFUSAL AT 9.0m
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 6
1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15
Method: SPIRAL AUGER JK300
Logged/Checked by: M.W./W.T.
R.L. Surface: ≈ 118.1m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION & AFTER 6 HRS	■					0			FILL/TOPSOIL: Silty sand, fine to coarse grained, grey, trace of root fibres and fine grained rounded quartz gravel.	M			GRASS COVER
								SP	SAND: fine to coarse grained, grey, trace of root fibres.	M	L		
	■			■	N = 5 1,0,5	1		SC	as above, but light grey.				
									CLAYEY SAND: fine to coarse grained, brown and orange brown, trace of fine grained rounded quartz gravel, root fibres and organic material				
				■	N = 6 5,3,3	2							
								-	SANDSTONE: fine to coarse grained, orange brown, with clay bands.	XW	EL		EXTREMELY LOW 'TC' BIT RESISTANCE
				■	N > 6 14,6/50mm REFUSAL	3						>600 >600	
						4							
				■	N = SPT 9/150mm REFUSAL							>600	
						5			SANDSTONE: fine to coarse grained, red brown, trace of fine grained rounded quartz clasts and clay bands.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW RESISTANCE
				■		6			as above, but with fine grained rounded quartz clasts.				SPT REFUSAL AT 6.0m
						7							

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BOREHOLE LOG

Borehole No. 6
2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15

Method: SPIRAL AUGER
JK300

Logged/Checked by: M.W./W.T.

R.L. Surface: ≈ 118.1m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
				■					SANDSTONE: fine to coarse grained, red brown.	XW-DW	EL-VL		
									END OF BOREHOLE AT 7.5m				
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 7
1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15
Method: SPIRAL AUGER JK300
R.L. Surface: ≈ 119.2m
Datum: AHD
Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
AFTER 1.5 HOURS ▼						0			FILL/TOPSOIL: Silty sand, fine to coarse grained, dark grey, trace of root fibres.	M			GRASS COVER
					N = 1 2,0,1			SC	CLAYEY SAND: fine to coarse grained, brown, trace of fine grained quartz and ironstone gravel.	W	VL		
ON COMPLET-ION						1			CLAYEY SAND: fine to coarse grained, orange brown, with fine grained rounded quartz gravel.	M	MD-D		
	■			■	N > 10 5,10/ 100mm REFUSAL	2							EXTREMELY LOW 'TC' BIT RESISTANCE
						3			CLAYEY SAND: fine to coarse grained, orange brown and red brown, trace of fine grained rounded quartz gravel.		D	>600	
				■	N = 32 8,12,20								
						4							
				■	N = SPT 15/50mm REFUSAL			-	SANDSTONE: fine to coarse grained, orange brown, trace of fine grained rounded quartz clasts.	XW/DW	EL/VL		EXTREMELY LOW TO LOW RESISTANCE
						5							
				■	N = SPT 13/150mm REFUSAL	6							
						7							

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BOREHOLE LOG

Borehole No. 7
2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15

Method: SPIRAL AUGER
JK300

R.L. Surface: ≈ 119.2m
Datum: AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									as above, but light orange brown, with fine grained rounded quartz gravel clasts.	XW/DW	EL/VL		
						8			END OF BOREHOLE AT 7.5m				
						9							
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. **8** 1/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 121.9m

Date: 26-8-15 **Datum:** AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION & AFTER 6.25 HOURS	■					0			FILL/TOPSOIL: Silty sand, fine to coarse grained, brown, with root fibres, trace of fine grained ironstone gravel.	M			GRASS COVER
								CL		MC>PL	VS-S		
	■			■	N = 2 2,4,1	1			SANDY CLAY: medium plasticity, orange brown and red brown, fine to coarse grained sand, trace of root fibres and fine grained rounded quartz gravel.				
									as above, but red brown.		H	>600 >600 >600	
				■	N = 16 6,6,10	2			as above, but low plasticity, and without root fibres.				
				■	N = 24 9,10,14	3						>600 >600 >600	
								-	INTERBEDDED SILTY CLAY: low plasticity, red brown and orange brown, fine to coarse grained sand, trace of fine grained rounded quartz gravel. AND SANDSTONE: fine to coarse grained, red brown and orange brown.	MC<PL/ XW	H/ EL		EXTREMELY LOW 'TC' BIT RESISANCE
				■	N > 9 6,9/100mm REFUSAL	4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 8
2/2

Client: BUNNINGS GROUP LIMITED

Project: PROPOSED WAREHOUSE

Location: LOT 33&34 DP243029,CNR.SAPPHIRE COAST DR.& TURA BEACH DR, TURA BEACH,NSW

Job No. 28682V
Date: 26-8-15

Method: SPIRAL AUGER
JK300

R.L. Surface: ≈ 121.9m
Datum: AHD

Logged/Checked by: M.W./W.T.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
				■		8			SANDSTONE: fine to coarse grained, orange brown.	XW-DW	EL-VL		EXTREMELY LOW TO VERY LOW RESISTANCE
				■		9			END OF BOREHOLE AT 9.0m				
						10							
						11							
						12							
						13							
						14							

EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. Not all notes are necessarily relevant to all reports. Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions are directly relevant only to the ground at the place where, and time when, the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as shown in the following table:

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact the backfill during construction, or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as fill, hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water 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 "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (e.g. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The locations of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength 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 F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm 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 150mm of, say, 4, 6 and 7 blows, as: N = 13 (4, 6, 7)
- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as: N>30 (15, 30/40mm)

The results of the test can be related empirically to the engineering properties of the soil. Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60 tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "Nc" on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

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

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line"

variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it 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 and may not be the same at the time of construction; 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 be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising at intervals ranging from several days to 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 perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, concrete, plastic, slag/ash, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classifications and rocks strengths indicated on the environmental logs unless noted in the 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, EIS should be notified immediately.

GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

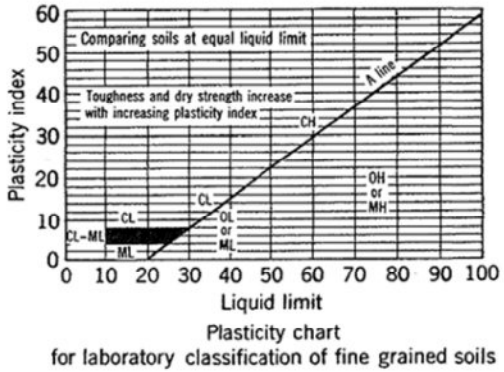
OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

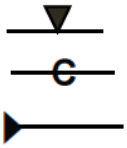
Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on [illegible])				Group Symbols	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes	*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate percentage of sand and gravel; maximum size; angularity, surface conditions, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW, GP, SW, SP* More than 12% *GM, GC, SM, SC* 5% to 12% *Borderline* cases requiring use of dual symbols $C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits above "A" line, with *PI* greater than 7 $C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits below "A" line with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing	*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)	*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)	*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes	*SW*	Well graded sands, gravelly sands, little or no fines		
			Predominantly one size or a range of sizes with some intermediate sizes missing	*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)	*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)	*SC*	Clayey sands, poorly graded sand-clay mixtures		
Fine-grained soils More than half of material is *smaller* than 75 μm sieve size (The 75 μm sieve size is about the smallest particle visible to naked eye)	Identification Procedures on Fraction Smaller than 380 μm Sieve Size						
		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)			
	Silts and clays liquid limit less than 50	None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)
		Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
		Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity	
	Silts and clays liquid limit greater than 50	Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
		High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays	
		Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity	
Highly Organic Soils		Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils	



Plasticity chart
for laboratory classification of fine grained soils

Note: 1 Soils possessing characteristics of two groups are designated by combinations of group symbols (eg. GW-GC, well graded gravel-sand mixture with clay fines).
2 Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown. Extent of borehole collapse shortly after drilling. Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils) (Cohesionless)	MC > PL MC ≈ PL MC < PL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (ID) Range (%)** / **SPT ' N' Value Range (Blows/300mm)** Very Loose <15 / 0-4 Loose 15-35 / 4-10 Medium Dense 35-65 / 10-30 Dense 65-85 / 30-50 Very Dense >85 / >50 Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise
Remarks	'V' bit 'TC' bit T_{60}	Hardened steel 'V' shaped bit. Tungsten carbide wing bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL	0.1	May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.3	A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	1	A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	10	A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH		A piece of core 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

Appendix E: Laboratory Report/s & COC Documents

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

CERTIFICATE OF ANALYSIS 133414

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Vittal Boggaram

Sample log in details:

Your Reference:	**E28682KB, Tura Beach**
No. of samples:	18 Soils
Date samples received / completed instructions received	28/08/15 / 28/08/15

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:	4/09/15 / 2/09/15
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	133414-1	133414-2	133414-3	133414-5	133414-7
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0-0.1	0.5-0.95	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	01/09/2015
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	%	88	88	87	91	93

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	133414-8	133414-9	133414-11	133414-13	133414-15
Your Reference	----------	BH4	BH5	BH6	BH7	BH8
Depth	----------	0.5-0.95	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	01/09/2015	01/09/2015	01/09/2015	01/09/2015	01/09/2015
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	%	94	84	86	86	85

vTRH(C6-C10)/BTEXN in Soil				
Our Reference:	UNITS	133414-16	133414-17	133414-18
Your Reference	----------	BH8	DUP1	TBS
Depth	----------	0.8-1	-	-
Date Sampled		27/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	01/09/2015	01/09/2015	01/09/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	[NA]
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	[NA]
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	89	88	99

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	133414-1	133414-2	133414-3	133414-5	133414-7
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0-0.1	0.5-0.95	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<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	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	83	82	85	86	87

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	133414-8	133414-9	133414-11	133414-13	133414-15
Your Reference	----------	BH4	BH5	BH6	BH7	BH8
Depth	----------	0.5-0.95	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<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	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	82	91	86	87	90

svTRH (C10-C40) in Soil			
Our Reference:	UNITS	133414-16	133414-17
Your Reference	----------	BH8	DUP1
Depth	----------	0.8-1	-
Date Sampled		27/08/2015	27/08/2015
Type of sample		Soil	Soil
Date extracted	-	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100
Surrogate o-Terphenyl	%	81	86

PAHs in Soil						
Our Reference:	UNITS	133414-1	133414-2	133414-3	133414-5	133414-7
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0-0.1	0.5-0.95	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	121	101	101	100	103

PAHs in Soil						
Our Reference:	UNITS	133414-8	133414-9	133414-11	133414-13	133414-15
Your Reference	----------	BH4	BH5	BH6	BH7	BH8
Depth	----------	0.5-0.95	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	100	109	102	103	104

PAHs in Soil			
Our Reference:	UNITS	133414-16	133414-17
Your Reference	----------	BH8	DUP1
Depth	----------	0.8-1	-
Date Sampled		27/08/2015	27/08/2015
Type of sample		Soil	Soil
Date extracted	-	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	102	107

Organochlorine Pesticides in soil						
Our Reference:	UNITS	133414-1	133414-3	133414-5	133414-7	133414-9
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
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	%	96	95	94	94	98

Organochlorine Pesticides in soil					
Our Reference:	UNITS	133414-11	133414-13	133414-15	133414-17
Your Reference	----------	BH6	BH7	BH8	DUP1
Depth	----------	0-0.1	0-0.1	0-0.1	-
Date Sampled		26/08/2015	27/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	94	100	96

Organophosphorus Pesticides						
Our Reference:	UNITS	133414-1	133414-3	133414-5	133414-7	133414-9
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	94	94	98

Organophosphorus Pesticides					
Our Reference:	UNITS	133414-11	133414-13	133414-15	133414-17
Your Reference	----------	BH6	BH7	BH8	DUP1
Depth	----------	0-0.1	0-0.1	0-0.1	-
Date Sampled		26/08/2015	27/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	99	94	100	96

PCBs in Soil						
Our Reference:	UNITS	133414-1	133414-3	133414-5	133414-7	133414-9
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	95	94	94	98

PCBs in Soil					
Our Reference:	UNITS	133414-11	133414-13	133414-15	133414-17
Your Reference	----------	BH6	BH7	BH8	DUP1
Depth	----------	0-0.1	0-0.1	0-0.1	-
Date Sampled		26/08/2015	27/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	99	94	100	96

Acid Extractable metals in soil						
Our Reference:	UNITS	133414-1	133414-2	133414-3	133414-5	133414-7
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0-0.1	0.5-0.95	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	17	3	1	2
Copper	mg/kg	<1	<1	1	<1	<1
Lead	mg/kg	2	3	4	<1	2
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	2	<1	<1	<1
Zinc	mg/kg	1	<1	2	<1	2

Acid Extractable metals in soil						
Our Reference:	UNITS	133414-8	133414-9	133414-11	133414-13	133414-15
Your Reference	----------	BH4	BH5	BH6	BH7	BH8
Depth	----------	0.5-0.95	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	1	4	2	7
Copper	mg/kg	<1	<1	<1	<1	<1
Lead	mg/kg	4	2	1	2	3
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	<1	<1	<1	1
Zinc	mg/kg	2	2	1	1	2

Acid Extractable metals in soil			
Our Reference:	UNITS	133414-16	133414-17
Your Reference	----------	BH8	DUP1
Depth	----------	0.8-1	-
Date Sampled		27/08/2015	27/08/2015
Type of sample		Soil	Soil
Date prepared	-	31/08/2015	31/08/2015
Date analysed	-	31/08/2015	31/08/2015
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	36	5
Copper	mg/kg	<1	<1
Lead	mg/kg	4	2
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	4	1
Zinc	mg/kg	2	2

Moisture						
Our Reference:	UNITS	133414-1	133414-2	133414-3	133414-5	133414-7
Your Reference	----------	BH1	BH1	BH2	BH3	BH4
Depth	----------	0-0.1	0.5-0.95	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	1/09/2015	1/09/2015	1/09/2015	1/09/2015	1/09/2015
Moisture	%	18	13	18	17	19

Moisture						
Our Reference:	UNITS	133414-8	133414-9	133414-11	133414-13	133414-15
Your Reference	----------	BH4	BH5	BH6	BH7	BH8
Depth	----------	0.5-0.95	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
Date analysed	-	1/09/2015	1/09/2015	1/09/2015	1/09/2015	1/09/2015
Moisture	%	13	30	21	25	21

Moisture			
Our Reference:	UNITS	133414-16	133414-17
Your Reference	----------	BH8	DUP1
Depth	----------	0.8-1	-
Date Sampled		27/08/2015	27/08/2015
Type of sample		Soil	Soil
Date prepared	-	31/08/2015	31/08/2015
Date analysed	-	1/09/2015	1/09/2015
Moisture	%	18	24

Asbestos ID - soils						
Our Reference:	UNITS	133414-1	133414-3	133414-5	133414-7	133414-9
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	26/08/2015	26/08/2015	26/08/2015	26/08/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	1/09/2015	1/09/2015	1/09/2015	1/09/2015	1/09/2015
Sample mass tested	g	Approx. 30g	Approx. 20g	Approx. 35g	Approx. 20g	Approx. 15g
Sample Description	-	Grey fine grain soil	Grey fine grain soil	Grey fine grain soil	Grey fine grain soil	Grey fine grain soil
Asbestos ID in soil	-	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	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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils				
Our Reference:	UNITS	133414-11	133414-13	133414-15
Your Reference	----------	BH6	BH7	BH8
Depth	----------	0-0.1	0-0.1	0-0.1
Date Sampled		26/08/2015	27/08/2015	27/08/2015
Type of sample		Soil	Soil	Soil
Date analysed	-	1/09/2015	1/09/2015	1/09/2015
Sample mass tested	g	Approx. 25g	Approx. 50g	Approx. 20g
Sample Description	-	Grey fine grain soil	Grey fine grain soil	Grey fine grain soil
Asbestos ID in soil	-	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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

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-008	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-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.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	133414-1	<25 || <25	LCS-2	106%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	133414-1	<25 || <25	LCS-2	106%
Benzene	mg/kg	0.2	Org-016	<0.2	133414-1	<0.2 || <0.2	LCS-2	100%
Toluene	mg/kg	0.5	Org-016	<0.5	133414-1	<0.5 || <0.5	LCS-2	100%
Ethylbenzene	mg/kg	1	Org-016	<1	133414-1	<1 || <1	LCS-2	110%
m+p-xylene	mg/kg	2	Org-016	<2	133414-1	<2 || <2	LCS-2	111%
o-Xylene	mg/kg	1	Org-016	<1	133414-1	<1 || <1	LCS-2	107%
naphthalene	mg/kg	1	Org-014	<1	133414-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	97	133414-1	88 || 90 || RPD: 2	LCS-2	96%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	133414-1	<50 || <50	LCS-2	95%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	133414-1	<100 || <100	LCS-2	85%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	133414-1	<100 || <100	LCS-2	71%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	133414-1	<50 || <50	LCS-2	95%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	133414-1	<100 || <100	LCS-2	85%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	133414-1	<100 || <100	LCS-2	71%
Surrogate o-Terphenyl	%		Org-003	81	133414-1	83 || 86 || RPD: 4	LCS-2	117%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	LCS-2	94%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	LCS-2	89%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	LCS-2	94%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	LCS-2	91%

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	133414-1	<0.1 || <0.1	LCS-2	96%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	LCS-2	94%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	133414-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	133414-1	<0.05 || <0.05	LCS-2	105%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	103	133414-1	121 || 70 || RPD: 53	LCS-2	99%
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	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
HCB	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	82%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	94%
Heptachlor	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	90%
delta-BHC	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	93%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	96%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	94%
Dieldrin	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	100%
Endrin	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	LCS-2	95%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	99	133414-1	96 || 94 || RPD: 2	LCS-2	110%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	87%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	96%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	100%
Dimethoate	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	100%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	106%
Malathion	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	99%
Parathion	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	LCS-2	88%
Ronnel	mg/kg	0.1	Org-008	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	99	133414-1	96 || 94 || RPD: 2	LCS-2	93%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-2	31/08/2015
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	LCS-2	102%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	133414-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	99	133414-1	96 || 94 || RPD: 2	LCS-2	92%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-7	31/08/2015
Date analysed	-			31/08/2015	133414-1	31/08/2015 || 31/08/2015	LCS-7	31/08/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	133414-1	<4 || <4	LCS-7	107%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	133414-1	<0.4 || <0.4	LCS-7	101%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	133414-1	7 || 7 || RPD: 0	LCS-7	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	133414-1	<1 || <1	LCS-7	107%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	133414-1	2 || 3 || RPD: 40	LCS-7	98%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	133414-1	<0.1 || <0.1	LCS-7	96%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	133414-1	2 || 2 || RPD: 0	LCS-7	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	133414-1	1 || 2 || RPD: 67	LCS-7	101%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Date analysed	-	133414-16	01/09/2015 || 01/09/2015	133414-3	31/08/2015
TRHC$_6$ - C$_9$	mg/kg	133414-16	<25 || <25	133414-3	100%
TRHC$_6$ - C$_{10}$	mg/kg	133414-16	<25 || <25	133414-3	100%
Benzene	mg/kg	133414-16	<0.2 || <0.2	133414-3	96%
Toluene	mg/kg	133414-16	<0.5 || <0.5	133414-3	96%
Ethylbenzene	mg/kg	133414-16	<1 || <1	133414-3	101%
m+p-xylene	mg/kg	133414-16	<2 || <2	133414-3	103%
o-Xylene	mg/kg	133414-16	<1 || <1	133414-3	100%
naphthalene	mg/kg	133414-16	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	133414-16	89 || 90 || RPD: 1	133414-3	92%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Date analysed	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	133414-16	<50 || <50	133414-3	102%
TRHC$_{15}$ - C$_{28}$	mg/kg	133414-16	<100 || <100	133414-3	90%
TRHC$_{29}$ - C$_{36}$	mg/kg	133414-16	<100 || <100	133414-3	#
TRH>C$_{10}$-C$_{16}$	mg/kg	133414-16	<50 || <50	133414-3	102%
TRH>C$_{16}$-C$_{34}$	mg/kg	133414-16	<100 || <100	133414-3	90%
TRH>C$_{34}$-C$_{40}$	mg/kg	133414-16	<100 || <100	133414-3	#
Surrogate o-Terphenyl	%	133414-16	81 || 80 || RPD: 1	133414-3	123%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Date analysed	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Naphthalene	mg/kg	133414-16	<0.1 || <0.1	133414-3	101%
Acenaphthylene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	133414-16	<0.1 || <0.1	133414-3	92%
Phenanthrene	mg/kg	133414-16	<0.1 || <0.1	133414-3	96%
Anthracene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	133414-16	<0.1 || <0.1	133414-3	91%
Pyrene	mg/kg	133414-16	<0.1 || <0.1	133414-3	95%
Benzo(a)anthracene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	133414-16	<0.1 || <0.1	133414-3	92%
Benzo(b,j+k)fluoranthene	mg/kg	133414-16	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	133414-16	<0.05 || <0.05	133414-3	100%
Indeno(1,2,3-c,d)pyrene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	133414-16	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	133414-16	102 || 100 || RPD: 2	133414-3	99%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	133414-3	31/08/2015
Date analysed	-	[NT]	[NT]	133414-3	31/08/2015
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	133414-3	79%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	133414-3	90%
Heptachlor	mg/kg	[NT]	[NT]	133414-3	86%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	133414-3	89%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	133414-3	92%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	133414-3	91%
Dieldrin	mg/kg	[NT]	[NT]	133414-3	97%
Endrin	mg/kg	[NT]	[NT]	133414-3	94%
pp-DDD	mg/kg	[NT]	[NT]	133414-3	99%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	133414-3	93%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	133414-3	109%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	133414-3	31/08/2015
Date analysed	-	[NT]	[NT]	133414-3	31/08/2015
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	133414-3	93%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	133414-3	95%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	133414-3	105%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	133414-3	99%
Fenitrothion	mg/kg	[NT]	[NT]	133414-3	106%
Malathion	mg/kg	[NT]	[NT]	133414-3	93%
Parathion	mg/kg	[NT]	[NT]	133414-3	86%
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	133414-3	97%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	133414-3	31/08/2015
Date analysed	-	[NT]	[NT]	133414-3	31/08/2015
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	133414-3	106%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	133414-3	91%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Date analysed	-	133414-16	31/08/2015 || 31/08/2015	133414-3	31/08/2015
Arsenic	mg/kg	133414-16	<4 || <4	133414-3	93%
Cadmium	mg/kg	133414-16	<0.4 || <0.4	133414-3	101%
Chromium	mg/kg	133414-16	36 || 33 || RPD: 9	133414-3	102%
Copper	mg/kg	133414-16	<1 || <1	133414-3	103%
Lead	mg/kg	133414-16	4 || 4 || RPD: 0	133414-3	96%
Mercury	mg/kg	133414-16	<0.1 || <0.1	133414-3	95%
Nickel	mg/kg	133414-16	4 || 4 || RPD: 0	133414-3	97%
Zinc	mg/kg	133414-16	2 || 2 || RPD: 0	133414-3	97%

Report Comments:

TRHs in soil (semi-vol):
Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample/s.

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

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 (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics 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 RECEIPT ADVICE

Client Details	
Client	Environmental Investigation Services
Attention	Vittal Boggaram

Sample Login Details	
Your Reference	E28682KB, Tura Beach
Envirolab Reference	133414
Date Sample Received	28/08/2015
Date Instructions Received	28/08/2015
Date Results Expected to be Reported	04/09/2015

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	18 Soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	8.0
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
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ph 02 9910 6200 fax 02 9910 6201
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Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*svTRH (C10-C40) in Soil*	*PAHs in Soil*	*Organochlorine Pesticides in soil*	*Organophosphorus Pesticides*	*PCBs in Soil*	*Acid Extractable metals in soil*	*Asbestos ID - soils*	*On Hold*
BH1-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH1-0.5-0.95	✓	✓	✓				✓		
BH2-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-0.7-1.0									✓
BH3-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH3-0.5-0.95									✓
BH4-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH4-0.5-0.95	✓	✓	✓				✓		
BH5-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH5-0.5-0.95									✓
BH6-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH6-0.8-1.0									✓
BH7-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH7-1.5-1.75									✓
BH8-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH8-0.8-1	✓	✓	✓				✓		
DUP1	✓	✓	✓	✓	✓	✓	✓		
TBS	✓								

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E28682KB	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: STANDARD	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 1 of 1	Attention: Vittal Boggaram
Attention: Aileen		vboggaram@jkgroup.net.au

Location: TURA BEACH

Sampler: MW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
26/8/15	1	BH1	0/0.1	G, A	0	Fill				X								
	2	↓	0.5/0.95			Sand		X										
	3	BH2	0/0.1			Fill				X								
	4	↓	0.7/1.0			Sand												
	5	BH3	0/0.1			Fill				X								
	6	↓	0.5/0.95			Sand												
	7	BH4	0/0.1			Fill				X								
	8	↓	0.5/0.95		↓	Sand		X										
	9	BH5	0/0.1		0.4	Fill				X								
	10	↓	0.5/0.95		0	Sand												
	11	BH6	0/0.2			Fill				X								
↓	12	↓	0.8/1.0		↓	Sand												
27/8/15	13	BH7	0/0.1		0.3	Fill				X								
	14	↓	1.5/1.75		0	Sand												
	15	BH8	0/0.1		0.6	Fill				X								
↓	16	↓	0.8/1	↓	0	Clay		X										
↓	17	DUP1	–	G	–	–			X									
↓	18	TBS	–	G	–	Sand								X				

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

Job No: 133414

Date Received: 28/8/15

Time Received: ~~14:30~~

Received by: PT

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Vittal. B. S	28/8/15		PT	28/8/15

Appendix F: Report Explanatory Notes

STANDARD SAMPLING PROCEDURE

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS.

The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

- Prepare a borehole/test pit log or made a note of the sample description for stockpiles.
- Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill rig/excavator such that the machine can operate in a safe manner.
- Ensure all sampling equipment has been decontaminated prior to use.
- Remove any surface debris from the immediate area of the sampling location.
- Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
- Collect samples for asbestos analysis and place in a zip-lock plastic bag.
- Label the sampling containers with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
- Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.
- Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-1993[20].
- Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with the standards outlined in the report.
- Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.
- Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

- All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc. Equipment and materials required for the decontamination include:
  - Phosphate free detergent (Decon 90);
  - Potable water;
  - Stiff brushes; and
  - Plastic sheets.

[20] Standards Australia, (1993), *Geotechnical Site Investigations.* (AS1726-1993)

- Ensure the decontamination materials are clean prior to proceeding with the decontamination.
- Fill both buckets with clean potable water and add phosphate free detergent to one bucket.
- In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.
- Rinse sampling equipment in the bucket containing potable water.
- Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes, then the equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
    - Micropore filtration system or Stericup single-use filters (for heavy metals samples);
    - Filter paper for Micropore filtration system; Bucket with volume increments;
    - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
    - Bucket with volume increments;
    - Flow cell;
    - pH/EC/Eh/T meters;
    - Plastic drums used for transportation of purged water;
    - Esky and ice;
    - Nitrile gloves;
    - Distilled water (for cleaning);
    - Electronic dip meter;

- Low flow pump pack and associated tubing; and
- Groundwater sampling forms.

- If single-use stericup filtration is not used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.
- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
- Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

- All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
  - Phosphate free detergent;
  - Potable water;
  - Distilled water; and
  - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994[21]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[22]).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations.

"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit" Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

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[21] US EPA, (1994), *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[22] Keith., H, (1991), *Environmental Sampling and Analysis, A Practical Guide.*

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms; Sample receipt form;
- All sample results reported; All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (eg. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$