



**DEPARTMENT OF VETERAN AFFAIRS
PHASE 1 CONTAMINATED LAND
ASSESSMENT
114 NEWDEGATE STREET
GREENSLOPES QUEENSLAND**

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ABBREVIATIONS

AHD	Australian Height Datum
BCC	Brisbane City Council
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C₆-C₃₆	Hydrocarbon chainlength fraction
CLR	Contaminated Land Register
CoC	Chain of Custody
DEHP	Department of Environment and Heritage
DNRW	Queensland Department of Natural Resources and Water
EMR	Environmental Management Register
GST	Goods and Service Tax
LOR	Limit of Reporting
mg/kg	milligrams per kilogram
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticide
OPP	Organophosphorous Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
TRH	Total Recoverable Hydrocarbon
UXO	Unexploded Ordnance

EXECUTIVE SUMMARY

The Department of Veteran Affairs commissioned Coffey to undertake a Phase 1 Contaminated Land Assessment of 114 Newdegate Street, Greenslopes, Queensland. The site at the time of investigation was operated by the Australian Red Cross and included a community hall and a closed accommodation building located on the corner of Newdegate Street and Headfort Street, Greenslopes. The site was made up of three legal properties (Lots 123, 124 and 125 on RP46047).

The objective of the contamination land assessment was to better define the risks presented by the current site condition to potential future site users. The Phase 1 Site Contamination Assessment included a desk top review (site history and publically available information), site walkover and a limited soil sampling program. The information collected was used to develop a site conceptual model, undertake a qualitative risk assessment and to assess additional investigation requirements and potential remediation/management options and cost.

Desk Top Review

The site and the properties immediately surrounding it, were developed prior to the earliest available aerial photograph in 1944. The Commonwealth of Australia had interests in the property from as early as 1901 with a three year lease. The War Services Home Commissioner became the registered owner of the property in 1920 and the property was transferred to the current registered owner 'Repatriation Commission' in 1950.

The properties, on which the site is located, are not contained on the Queensland Environmental Management Register and the Brisbane City Council does not hold any information in regards to dangerous goods/hazardous materials licences or environmental authorities associated with the site.

Representatives of the site operators (Australian Red Cross) were not aware of any spills or releases of hazardous contaminants, pest infestations, major refurbishments, building fires or storage of hazardous materials other than minor storage of cleaning chemicals and paints.

Site Walkover

The site walkover identified the following.

- Fragments of asbestos containing materials were observed beneath both site buildings and within the front vegetated area. The fragments of asbestos observed were generally in poor condition and lying on the soil surface.
- Paint on the buildings was in poor condition and peeling and has the potential to contain lead and other metals.
- Evidence of former termite infestations was present underneath the southern building. Pesticides may have been used to remove the termite infestation.
- There is potential for pesticide use in the north eastern corner of the site where stressed vegetation was present and a neighbouring property had an orchid shade house.

Limited Soil Sampling Program

The limited soil sampling program included the collection of four surface soil samples from locations that were considered to have the highest potential for contamination. The limited soil sampling program identified the following.

- Concentrations of zinc detected in two of the four samples have the potential to impact on ecosystems in urban residential/public open spaces. The concentrations of zinc detected did not

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exceed the human health based investigations levels for standard residential environments. The zinc is anticipated to be associated with peeling paint and flecks of paint in the soil.

- Detectable concentrations of organochlorine pesticides were present in all four soil samples analysed. The organochlorine pesticides detected is consistent with historical treatment of pests such as termites. The concentrations of all organochlorine pesticides detected were below the nominated investigation levels and do not pose an unacceptable risk to current and future site users. However, it should be noted the limited nature of the sampling program (four surface soil samples only) does not provide adequate site coverage for hotspot detection.
- Asbestos fibres were detected in soil samples SS01 (0.007% weight/weight) and SS02 (0.02% weight/weight). These concentrations of asbestos fibres are above the recommended investigation level for fibrous asbestos or asbestos fines in soil for all site uses. Therefore, the detected concentrations have the potential to impact on current and future site users.

Site Conceptual Model and Qualitative Risk Assessment

The site conceptual model identified potentially complete exposure pathways to the following potential human receptors.

- Australian Red Cross personnel.
- Community groups that use the site facilities.
- Maintenance contractors and caretakers.
- Future construction personnel.
- Future land users.
- Surrounding land users.

The qualitative risk assessment identified that maintenance contractors and caretakers, future construction personnel and potential future site users have a potential high risk associated with the pesticides and fibrous asbestos within the soil. Due to the potential for these receptors to disturb the soil profile releasing asbestos fibres and to come into contact with the soil, the likelihood of exposure is higher than that for other site users.

As the Australian Red Cross personnel have access to areas beneath the southern building and are more likely to access areas of the site where exposed soil is present, the qualitative risk assessment indicated they have a moderate risk. However, it should be noted that it is considered unlikely that exposure has or will occur.

The qualitative risk assessment indicated that all other identified receptors had a low risk primarily due to the limited access to contaminated areas.

Additional Investigations and Remediation/Management

Due to the presence of asbestos containing materials, asbestos fines within the soil and the detected concentrations of zinc and organochlorine pesticides, additional investigations have been recommended to provide greater sampling densities for hot spot detection and to provide additional information to allow more detailed assessment of risks. The additional investigations should be undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure and relevant Australian Standards. The assessment of asbestos risks should

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include both asbestos containing materials and asbestos fines in soil. The anticipated cost to complete the recommended investigation works is \$28,006 (excluding GST).

Any remediation or management of contaminated soil would be dependent on the results of the additional investigation works and proposed future site use. The remediation/management options identified include.

- Encapsulation/engineering controls of contaminated materials on-site – retention of the contaminated material on-site with placement of engineering controls to prevent access to contaminated material and therefore preventing complete exposure pathways being formed. The indicative cost to complete this remediation/management option is in the order of \$90,000 (excluding GST)
- Excavation and off-site disposal of contaminated material – removal of the contaminated soil from site to a licensed landfill for disposal. This remediation option would require the removal of the site infrastructure and building prior to remediation works being undertaken. The indicative cost to complete this remediation option post the removal of the site infrastructure and buildings is in the order of \$105,000 (excluding GST).

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1 INTRODUCTION

The Department of Veteran Affairs commissioned Coffey to undertake a Phase1 Contaminated Land Assessment of 114 Newdegate Street, Greenslopes, Queensland.

The site at the time of investigation was operated by the Australian Red Cross and included a community hall and a closed accommodation type building located on the corner of Newdegate Street and Headfort Street, Greenslopes. The site was made up of three legal properties (Lots 123, 124 and 125 on RP46047).

1.1 Objectives

The objective of the contamination land assessment was to better define the risks presented by the current site condition to potential future site users.

1.2 Scope of Works

The Phase 1 Site Contamination Assessment was undertaken in accordance with the 2013 revision of the National Environment Protection Council (NEPC 1999) National Environment Protection (Assessment of Site Contamination) Measure (NEPM), which is the adopted Queensland and Commonwealth guideline for the assessment of contaminated sites. The investigation was overseen by individuals (Matthew Chenery) that are deemed suitably qualified under the Queensland Environmental Protection Act (1994) for the assessment of contaminated sites.

The Phase 1 investigation focused on identification of current and historical potentially contaminating activities and identification of sensitive land uses. The Phase 1 investigation included the following.

Review of publically available records, comprising of:

- historical aerial photographs;
- current and historical title records;
- site layout plans and previous investigation reports (where available);
- licences and notices (i.e. hazardous material storage, trade waste, dangerous goods etc.);
- service plans (“dial before you dig” search);
- State groundwater database;
- Department of Environment and Heritage Protection (DEHP) Environmental Management Register (EMR) and contaminated land register (CLR);
- DEHP regional sensitive ecosystem database; and
- publicly available topographic, geological and hydrogeological maps.

A site walkover which included:

- observation of current site layout and uses of the property;
- general description of current and/or previous site operations;

- identification of current and historical (where possible) uses of adjoining properties and potentially sensitive receptors nearby;
- confirmation of validity of publicly available information;
- assessment for visual signs of ground contamination;
- details and locations of current and former underground services;
- observations of discharges to land, water and air;
- observations of waste disposal locations; and
- local site knowledge of current and former owners or occupiers, and/or employees.

The limited sampling program provided for the collection of four surface soil samples to better assess potential data gaps. The limited sampling program included the following:

- selection of the four surface soil sample locations (SS01 to SS04) in a judgemental sampling pattern targeted at areas of potential contamination;
- collection of soil samples at the surface by hand utilising a new nitrile glove;
- recording of soil/fill types and any evidence of potential contamination; and
- analysis of four samples at a National Association of Testing Authorities (NATA) accredited laboratory for total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphate pesticides (OC/OP), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and asbestos in soil.

2 DESK TOP INVESTIGATION

2.1 Site Identification

The site consisted of three legal properties (Lots 123, 124 and 125 on RP46047) and was known as 114 Newdegate Street, Greenslopes and was located immediately across Newdegate Street from the Greenslopes Private Hospital (**Figure 1**). The site was operated by the Australian Red Cross and included a community hall and disused accommodation facilities. **Appendix A** contains site photographs and **Table A** provides a summary of the property details.

Table A: Summary of Site Identification

Lot 123 RP46047	
Street Address	Headfort Street, Greenslopes, Brisbane, Queensland
Area	647m ²
Zoning	Community Use
Local Government Area	Brisbane
Parish	Bulimba
County	Stanley
Tenure	Freehold
Current Occupier(s)	Australian Red Cross
Current Owner	Repatriation Commission
Current Site Use(s)	Part of community hall and disused accommodation buildings.
Lot 124 RP46047	
Street Address	Headfort Street, Greenslopes, Brisbane, Queensland
Area	639m ²
Zoning	Community Use (Brisbane City Council 2013 Draft New City Plan)
Local Government Area	Brisbane
Parish	Bulimba
County	Stanley
Tenure	Freehold
Current Occupier(s)	Australian Red Cross
Current Owner	Repatriation Commission
Current Site Use(s)	Part of community hall and disused accommodation buildings.

Lot 125 RP46047	
Street Address	Corner of Newdegate and Headfort Street, Greenslopes, Brisbane, Queensland.
Area	647m ²
Zoning	Community Use (Brisbane City Council 2013 Draft New City Plan)
Local Government Area	Brisbane
Parish	Bulimba
County	Stanley
Tenure	Freehold
Current Occupier(s)	Australian Red Cross
Current Owner	Repatriation Commission
Current Site Use(s)	Part of community hall and disused accommodation buildings.

A copy of the current title for each of the properties is included within **Appendix B**, registered plan within **Appendix C** and zoning search within **Appendix D**.

2.2 Topography and Drainage

Topographical features were identified by a review of the Queensland Topography Map, Mt Gravatt, 1:25,000, Sheet 9542-44 (1980). The site is at approximately 25mAHD, and slopes moderately down towards the north towards Norman Creek which is located approximately 900m north west of the site. Surface runoff from the site and surrounding properties is directed into in-ground stormwater systems. A Brisbane City Council underground stormwater drain is located on the property immediately to the east of the site and a stormwater connection pit is located in the north east corner of the site.

2.3 Local Geology

The City of Brisbane (1:31,680) Economic Geology Sheet 3 (1965) indicates the site is underlain by Greywacke, siltstone, shale, chert, jasper and basic volcanics. The economic geology map also indicates an abandoned quartzite mine was located approximately 700m to the west of the site.

2.4 Local Hydrogeology

The Groundwater Resources of Queensland Map (1:2,500,000 Hydrogeological Series 1987) indicated the regional groundwater underlying the site is held within sedimentary strata (sandstone, shale and conglomerate). Groundwater is expected to have a bore yield of less than 5 litres per second and a salinity ranging from 500 mg/L to 1,500 mg/L (suitable for most purposes, however marginal for human consumption and crops with a low salt tolerance).

2.5 Groundwater Bore Search

A search for registered groundwater bores was undertaken and a copy of the groundwater bored card report is included in **Appendix E**. One registered groundwater bore was located within a 1km radius of the site. The registered bore was located approximately 920m to the east and was drilled to 65.50m below ground surface (mbgs). The bore card report notes the bore was backfilled due to insufficient water and the salinity of the water encountered.

2.6 Regional Ecosystems

Regional Ecosystems and Essential Habitat Maps were obtained from Queensland Government Property Map of Assessable Vegetation. A copy of the regional ecosystem search result is included in **Appendix F**. The regional ecosystem search identified the following

Approximately 300m to the south east of the site:

- Vegetation Management Act essential regrowth habitat;
- high value regrowth vegetation containing endangered regional ecosystems;
- high value regrowth vegetation containing of concern regional ecosystems; and
- high value regrowth vegetation that is a least concern regional ecosystems.

Approximately 500m to the west of the site:

- Vegetation Management Act essential regrowth habitat;
- high value regrowth vegetation containing endangered regional ecosystems; and
- high value regrowth vegetation that is a least concern regional ecosystems.

2.7 Unexploded Ordnance

A search of the Department of Defence Unexploded Ordnance (UXO) location database did not identify any unexploded ordnance risk areas within or surrounding the site. The result of the UXO search is contained in **Appendix G**.

2.8 Acid Sulphate Soils

A review of the Queensland Government (2003) (1:100,000) Acid Sulfate Soils Tweed Heads to Redcliffe Map 1 indicated the site lies within "land not assessed for ASS". As the site is located at approximately 25m AHD the potential for acid sulphate soils at the site was considered low.

2.9 Environmental Management Register

A search of the Environmental Management Register (EMR) and the Contaminated Land Register (CLR) indicated the properties that form the site are not registered on either the EMR or CLR. Refer to **Appendix H** for the search results.

The site walkover did not identify any other current or historical activities that are defined under the Environmental Protection Act (1994) as a 'notifiable activity'.

2.10 Local Government Records

A 'Right to Information' search was undertaken with the Brisbane City Council. The search results indicated the Council did not hold any information in regards to dangerous goods, hazardous materials and environmental licenses for the property. Refer to **Appendix D** for the results of the local government search.

A zoning search of the Brisbane City Council Planning 2013 Draft New City Plan, identified the properties were zoned as Community Use. A copy of the zoning search is contained in **Appendix D**.

2.11 Desktop Investigation Key Findings and Data Gaps

The desktop investigation did not identify any key potential risks that would be likely to impact on the future use of the site.

3 SITE HISTORY

The site history assessment was undertaken utilising publicly available information and information obtained through interviews with representatives of the site operators, the Australian Red Cross. The site history information was reviewed for evidence of potential contamination, sensitive receptors and environmental aspects that may restrict potential future use of the site.

3.1 Historical Aerial Photographs

Aerial photographs, which are publicly available via the Queensland Department of Natural Resources and Water (DNRW), were reviewed for historical land use information and potentially contaminating activities. **Table B** summarises the results of the aerial photograph review and copies of available aerial photos are included in **Appendix I**.

Table B: Summary of the Aerial Photography Review

Year	Title of Photography	Scale	Comments
1944	Beenleigh Run 1. Frame 346.	1:33,800	Note the scale of the aerial photograph prevents site detail to be seen clearly. The site and immediately surrounding properties were observed to be developed in the 1944 photograph. However it is possible the buildings present were different to the current buildings. Properties to the north, east and south appeared to be residential and the property on the west of Newdegate Street appeared to be an early configuration of the Greenslopes Hospital.
1955	Beenleigh Run 1. Frame 26.	1:25,000	The site appeared to support the current two buildings. Quarry/mining operations (quartzite mine) was visible to the west of the Greenslopes Hospital.
1968	Beenleigh Run 1. Frame 169.	1:22,900	As per the 1955 photograph.
1978	Beenleigh Run 1. Frame 4044.	1:25,000	Site and immediately surrounding properties as per the 1968 photograph. To the west of the Greenslopes hospital the South East Freeway is visible and mining operations appear to have ceased.
1987	Beenleigh Run 1. Frame 205.	1:25,000	As per the 1978 photograph.

1997	Beenleigh Run 1. Frame 20.	1:25,000	As per the 1987 photograph.
2002	Beenleigh Run 1. Frame 105.	1:25,000	As per the 1997 photograph.

The review of historical aerial photographs covering the site and immediately surrounding area were developed prior to the earliest available photograph from 1944. The site and surrounding land uses appear to have been predominantly used for residential and hospital type purposes.

3.2 Certificate of Title Review

The review of current title indicates the registered owner of the properties is the Repatriation Commission. Copies of current and historical title search results and a copy of the registered plans are contained in **Appendix B. Table C** below summarises the historical certificates of title.

Table C: Summary of the Historical Certificates of Title

Year	Registered Owners	Comments
1858	Thomas Blackel Stephens/Anne Stephens	Portion 102, 52 acres. Three year Lease to Commonwealth of Australia in 1901. Transfer to Stephens Estates Limited 1904.
1873	Thomas Blackel Stephens/Anne Stephens	Portion 102A, 4 acres 32 perches.
1920	War Services Home Commissioner	Sub 1 of Portion 102, 46 acres 26 perches.
1950	Repatriation Commission	Resub 2 and 134 to 173, 10 acres 15 39/100 perches.

The review of the historical certificates of title indicated the Commonwealth of Australia had interests in the site from as early as 1901 with a lease which covered the site and surrounding properties. The property was transferred to the current registered owners the Repatriation Commission in 1950.

3.3 Anecdotal Information

Anecdotal information was obtained during the site walkover from Ms Kathryn Cunneen, Regional Services Manager for the Australian Red Cross. Information obtained included.

- Northern building has been used for accommodation for hospital patients and carers and historically returned service personnel and has included a picture library, linen room and community/communal areas. There was no knowledge of any film processing on site, only storage of films.

- Southern building has been used for community use including showing of films, theatre and indoor sports within the main hall. Two caretakers' currently reside in the southern building.
- No knowledge of major refurbishments of the buildings and no knowledge of fires or major storm damage.
- No known infestations of pests such as termites that may have resulted in the application of pesticides to the building and surrounding soil.
- No knowledge of chemical spills/releases, waste disposal to ground or incineration of wastes.
- No known storage of hazardous materials other than minor volumes of cleaning chemicals and paints.

3.4 Site History Key Findings and Data Gaps

The site history review identified the property and the immediately surrounding properties were developed prior to 1944. The land on which the site is located was initially purchased from the Crown in 1858 and was initially leased by the Commonwealth in 1901 and transferred to the current registered owner the Repatriation Commission in 1950.

4 SITE WALKOVER

A site walkover was conducted by Coffey Environments with the assistance of the Australian Red Cross representative Ms Kathryn Cunneen on 16 July 2013. Photographs taken during the site walkover are contained in **Appendix J**.

Signage on the southern building indicated that funds (£70,365) used for the construction of the buildings were raised by the Volunatry Workers of the Red Cross Café from 1941 to 1945.

Both buildings were raised above ground level by concrete stumps.

Northern Building

The northern building has historically been used for accommodation, picture library, and general maintenance and communal areas. The two story building was generally in poor condition with peeling paint, fibro cement sheeting and corrugated asbestos cement sheeting. The ground floor was raised with concrete stumps forming a void beneath the northern building between ~500mm to 100mm above the underlying soil. The space formed underneath the building contained various items of debris including a 40L drum, plastic containers, building off-cuts and fragments of asbestos containing materials. The fragments of asbestos observed were generally in poor condition and lying on the soil surface.

Southern Building

The southern building was predominantly used as a community hall and included a stage, cinema projection box, two care taker residences, kitchen, dining area, storage areas, amenities, offices, small property maintenance workshop and cleaners store room. The southern building was generally in poor condition with peeling paint, fibro cement sheeting and corrugated asbestos cement sheeting roofing.

The southern building was raised on concrete stumps forming a void beneath the building that ranged in height between ~500mm and 2400mm. The northern portion of the void under the building had been built in to form areas for amenities, cleaners store room, maintenance workshop, general storage and a laundry. The portion of the void under the building that was not sealed with concrete showed visible signs of salt accumulation at the surface, indicating rising damp. Mould within the carpet and on the walls of the built in office area underneath the southern building also indicates that rising damp was present. Pieces of asbestos containing materials were also observed in the unsealed area beneath the building. The fragments of asbestos observed were generally in poor condition and lying on the soil surface.

The cleaners store room included the storage of eight, five litre containers of various detergents and chlorine based products. The maintenance workshop included various paint tins and mineral turps to an approximate volume of 70 litres. All chemical storage was within concrete sealed areas and no visible signs of spillage were observed.

An automatic fire sprinkler system was present underneath the western side of the southern building. The system was powered by the mains water pressure and had a manual pump for backup. No diesel or electrical powered equipment was associated with the automatic sprinkler system.

Some former termite damage was noted in the timber work under the western end of the building, which appeared to have been treated and some timber joists replaced.

External Property Areas

Areas external to the buildings were used for car parking, driveway, washing line, wheelie bin storage, footpaths and some limited landscaping at the street frontages. A single piece of asbestos containing material (~10cm x 7.5cm) was noted at the front of the northern building at the base of an African Tulip tree. The north east corner of the site was used for the storage of domestic type wheelie bins and what appeared to be a vegetation compost pile. Some recent herbicide use appears to have been undertaken in this back corner to control weeds.

Surrounding Land Use

Land uses to the north, east and south of the site were residential. Of note the property at the rear eastern boundary of the site had a shade house, which at the time of the site walkover was used for orchids and therefore, fertilisers and pesticides may have been used in this area. To the west of the site was the Greenslopes Private Hospital.

4.1 Site Walkover Key Findings and Data Gaps

The site walkover identified the following key potential risks.

- Fragments of asbestos containing materials were observed beneath both site buildings and within the front vegetated area. The fragments of asbestos containing materials observed were generally in poor condition and lying on the soil surface.
- Paint on the buildings was in poor condition and peeling and has the potential to contain lead and other metals.
- Evidence of former termite infestations was present underneath the southern building. Pesticides may have been used to remove the termite infestation.
- There is potential for pesticide use in the north eastern corner of the site where stressed vegetation was present and a neighbouring property had an orchid shade house.

5 LIMITED SAMPLING PROGRAM

To assist in the identification of potentially contaminated sites and assessment of the associated risks, a total of four surface soil samples (SS01 – SS04) were collected from locations presenting the highest potential for contamination.

The sample locations are illustrated on **Figure 2**.

5.1 Sampling Methodology

Soil samples were collected from surface soils using new disposable nitrile powder free gloves and laboratory prepared sample containers. Upon collection, samples were sealed with Teflon lined lids and were placed into eskies with ice to preserve the sample during storage and transport. Chain of custody documentation was completed at the time of sample collection and accompanied the samples during storage and transport to the laboratory. No reusable sampling equipment was utilised as part of this sampling program.

Samples were analysed at MGT Labmark laboratories, which are National Association of Testing Authorities (NATA) registered for the analyses undertaken. The four soil samples were analysed for Analysis of four samples at a National Association of Testing Authorities accredited laboratory for total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphate pesticides, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and asbestos in soil.

Due to the limited and preliminary nature of the sampling program and the absence of reusable sampling equipment use, no blind duplicate, split sample, trip blank or field rinsate quality control samples were considered necessary for the purpose of this investigation.

5.2 Nominated Investigation Levels

To assess potential environmental liabilities associated with contamination, the following nominated investigation levels have been used.

- National Environment Protection Council (1999) (2013 revision) National Environment Protection (Assessment of Site Contamination) Measure — Standard Residential land use setting.
- CRC CARE (2011) Technical Report No 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater – soil health screening levels for low density residential (sand, 0-<1m).

The nominated investigation levels are included with the analytical results tables (**Tables 1 to 3**).

5.3 Sample Descriptions

Based the desk top assessment and site walkover, soil samples were collected from those locations that presented the highest potential risk for contamination. **Table D** summarises the samples collected and contaminating activities/infrastructure targeted. The location of the sample points are shown on **Figure 2**.

Table D: Soil Sample Summary

Sample No.	Activities/Infrastructure Targeted/Soil Type
SS01	Area of salt accumulation beneath the southern building. Targeting asbestos and potential pesticide use. Clayey SILT, brown, moist, 0-50mm.
SS02	Within an unsealed area immediately below peeling paint and adjacent to timber potentially treated with pesticides and fibro cement sheeting. Silty Sand, organic matter, brown, moist, 0-50mm.
SS03	Beneath the northern building targeting asbestos and potential pesticide use. Clayey sandy SILT, dry, brown, 0-50mm.
SS04	Wheelie bin storage area and area of compost pile and stressed vegetation. Targeting pesticides and other wastes. Sandy Clay, organic matter, low plasticity, moist, brown, 0-100mm.

5.4 Analytical Results

The laboratory analytical results along with the nominated investigation levels are summarised in **Tables 1 to 3** and copies of the laboratory certificates are contained in **Appendix J**.

The analytical results identified the following:

- Detectable concentrations of hydrocarbons (C₁₆-C₃₄ – 260mg/kg) were detected in the soil sample SS04. The concentrations detected do not pose an unacceptable risk to current or future site users.
- Concentrations of zinc were detected in samples SS01 (760mg/kg) SS02 (2000mg/kg) above the expected natural background levels. Further assessment (cation exchange capacity and pH) would be required to determine if zinc concentrations in SS01 were above the ecological screening level for urban residential/public open space. The concentrations of zinc detected in SS02 would exceed the ecological screening level for urban residential/public open space. Therefore the concentrations of zinc identified at sample location SS02 has the potential to impact ecosystems in urban environments, primarily through phytotoxic effects (i.e. impact on vegetation). The concentrations of zinc detected did not exceed the human health based investigations levels for standard residential environments.
- Detectable concentrations of organochlorine pesticides (DDD, DDE, DDT, aldrin, dieldrin and/or chlordane) were present in all four soil samples analysed. The concentrations of all organochlorine pesticides detected were below the nominated investigation levels and do not pose an unacceptable risk to current and future site users.
- Asbestos fibres were detected in soil samples SS01 (0.007% weight/weight) and SS02 (0.02% weight/weight). These concentrations of asbestos fibres are above the recommended investigation level for fibrous asbestos or asbestos fines in soil for all site uses. Therefore, the detected concentrations have the potential to impact on current and future site users.
- The organophosphate pesticides and polycyclic aromatic hydrocarbons analytical results were below the laboratories detection limits.

5.4.1 Discussion of Limited Sampling Program Results

The concentrations of zinc detected in samples SS01 and SS02 were likely to be associated with peeling paint and possibly galvanised pipework in the proximity of the samples. As the concentrations of zinc are below the human health based investigation levels, they do not present an unacceptable risk to current and potential future site users.

The organochlorine pesticides detected are consistent with historical pesticides used to control insects such as termites. Although the limited sampling program did not detect concentrations of pesticides above the nominated investigation levels, they were detected in all samples analysed and further investigation into the distribution and identification of any hotspots is warranted. Additional investigations would provide increased sampling densities, which would allow for better characterisation of the health risks associated organochlorine pesticides at the site.

In addition to the asbestos containing materials observed on the site's surface, asbestos fibres were identified in the soil at concentrations that could potentially impact current and future site users. Access to and disturbance of the exposed soils beneath and immediately surrounding the site's buildings should be restricted until further investigations, mitigation measures and or remediation works are completed.

6 CONCEPTUAL SITE MODEL

This conceptual site model has been developed to determine the presence of plausible complete exposure pathways from potential contamination sources to receptors such as humans and/or the environment. For an identifiable risk to exist, an exposure pathway must be present, which requires each of the following to be identified.

- The presence of substances that may cause harm (**Source**).
- The presence of a receptor which may be harmed (**Receptor**).
- The existence of a means of exposing a receptor to the source (**Exposure Pathway**).

Outlined below are descriptions of the source, receptors and exposure pathways associated with the site and a summary of the potentially complete exposure pathways identified. For the purpose of this assessment, potential receptors are considered to include current site users, potential future site uses (including community use as per zoning and residential) and surrounding land users. A diagrammatical illustration of the conceptual site model is included as **Figure 3**.

6.1 Identified Potentially Contaminated Areas (Sources)

Areas of potential on site impact identified as part of this Phase 1 Contaminated Land Assessment and Contaminants of Potential Concern are summarised in **Table E** below.

Table E: Summary of Areas of Environmental Concern and Contaminants of Potential Concern

Area of Potential Concern	Contaminants of Potential Concern
Exposed soil beneath and immediately surrounding the site buildings.	Free asbestos fibres, metals and organochlorine pesticides.
Locations where asbestos containing material fragments are present.	Asbestos contained in bonded form which would require physical damage to release fibres.

6.2 Potential Receptors (Receptors)

Potential human exposures to contaminants at the site include:

- Australian Red Cross personnel;
- community groups that use the site facilities;
- maintenance contractors and caretakers;
- future construction personnel;
- future land users; and
- surrounding land users.

Potential environmental receptors are not considered to be present at the site with the nearest sensitive ecosystems located ~300m to the south east (up-gradient) and ~500m to the west of the site (across gradient).

6.3 Exposure Pathways (Exposure Pathway)

6.3.1 Potential Human Exposure Pathways

Potential human exposure pathways for the site include:

- dermal contact with contaminated soil by on site personnel undertaking maintenance or other activities;
- inhalation of contaminated dust by on site personnel undertaking maintenance or other activities or by community groups utilising the facilities;
- inhalation of contaminated dust by surrounding land users;
- ingestion of contaminated soil during or maintenance works.

6.4 Complete Exposure Pathways

Table F summarises the key potentially complete exposure pathways by which receptors may be exposed to the contaminants of potential concern.

Table F: Exposure Pathway Evaluation

Potential Receptors	Exposure Route	Potentially Complete Exposure Pathways	
		Exposed Soil Beneath and Immediately Surrounding Site Buildings	Locations Containing Fragments of Asbestos Containing Materials*
Australian Red Cross Personnel	Ingestion.	✓	✗
	Inhalation	✓	✓
	Dermal contact	✓	✗
Community Groups	Ingestion.	✗	✗
	Inhalation	✓	✓
	Dermal contact	✗	✗
Maintenance Contractors and Caretakers	Ingestion.	✓	✓
	Inhalation	✓	✓
	Dermal contact	✓	✗
Future Construction Personnel	Ingestion.	✓	✓
	Inhalation	✓	✓
	Dermal contact	✓	✗
Future Site Users	Ingestion.	✓	✓
	Inhalation	✓	✓
	Dermal contact	✓	✗
Surrounding Land Users	Ingestion.	✗	✗
	Inhalation	✓	✓
	Dermal contact	✗	✗

Notes

✓ Exposure pathway potentially complete – assessed qualitatively.

✗ Exposure pathway considered to be insignificant.

* Asbestos Containing Materials are those that have asbestos bound within a cement or other matrix and would require physical damage to release fibres.

7 RISK ASSESSMENT

7.1 Risk Assessment Methodology

The qualitative risk assessment has been carried out using the principles outlined in the Standards Australia (HB203:2012) Environmental Risk Management – Principles and Process. For the purpose of this qualitative risk assessment the measures of likelihood and consequence are summarised below.

Table G: Qualitative Measures of Likelihood

Level	Descriptor	Description
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Could occur
D	Unlikely	Could occur but not expected
E	Rare	Occurs only in exceptional circumstances

Table H: Qualitative Measures of Consequence

Level	Descriptor	Example Detail Description
1	Catastrophic	Death, toxic release off-site with detrimental effect, huge financial loss.
2	Major	Extensive injuries, loss of production capability, off-site release contained with outside assistance and little detrimental impact, major financial loss.
3	Moderate	Medical treatment required, on-site release contained with outside assistance, high financial loss.
4	Minor	First aid treatment, on-site release immediately contained, medium financial loss.
5	Insignificant	No injuries, low financial loss, negligible environmental impact.

Based on the likelihood and consequence the following risk analysis matrix has been used for this qualitative risk assessment to determine the level of risk.

Table I: Qualitative Risk Analysis Matrix: Level of risk

Likelihood	Consequence				
	Catastrophic	Major	Moderate	Minor	Insignificant
Almost certain	E	E	E	H	H
Likely	E	E	H	M	M
Possible	E	E	H	M	L
Unlikely	E	H	M	L	L
Rare	H	M	L	L	L

LEGEND:

E = Extreme risk; immediate action required.

H = High risk; senior management attention needed.

M = Moderate risk; management responsibility must be specified.

L = Low risk; manage by routine procedures.

7.2 Qualitative Risk Assessment Results

Table J summarises the results of the qualitative risk assessment for each of the identified sources and receptors with complete exposure pathways.

Table J: Qualitative Risk Assessment

Risk Dimension	Consequence Rating	Likelihood	Risk Level
<i>Exposed Soil Beneath and Immediately Surrounding Site Buildings</i>			
Australian Red Cross Personnel	Moderate	Unlikely	Moderate
Community Groups	Moderate	Rare	Low
Maintenance Contractors and Caretakers	Moderate	Possible	High
Future Construction Personnel	Moderate	Possible	High
Future Site Users	Moderate	Possible	High
Surrounding Land Users	Moderate	Rare	Low
<i>Locations with Fragments of Asbestos Containing Materials</i>			
Australian Red Cross Personnel	Moderate	Rare	Low
Community Groups	Moderate	Rare	Low
Maintenance Contractors and Caretakers	Moderate	Rare	Low
Future Construction Personnel	Moderate	Rare	Low
Future Site Users	Moderate	Rare	Low
Surrounding Land Users	Moderate	Rare	Low

7.3 Qualitative Risk Assessment Key Findings

The qualitative risk assessment identified that maintenance contractors and caretakers, future construction personnel and potential future site users have a potential high risk associated with the pesticides and fibrous asbestos within the soil. Due to the potential for these receptors to disturb the soil profile releasing asbestos fibres and to come into contact with the soil, the likelihood of exposure is higher than that for other site users.

As the Australian Red Personnel have access to areas beneath the southern building and are more likely to access areas of the site where exposed soil is present, the qualitative risk assessment indicated they have a moderate risk. However, it should be noted that it is considered 'unlikely' that exposure that has the potential to impact human health has or will occur due to the nature of activities undertaken by the Australian Red Cross Personnel.

The qualitative risk assessment indicated that all other identified receptors had a low risk primarily due to the limited access to contaminated areas.

It should be noted the qualitative risk assessment was based on 'actual risks' and does not take into account 'perceived risks'. Current society 'perceived risks' in Australia associated with asbestos is considered to be significantly higher than the 'actual risks' presented. Therefore, any consideration of contamination management or remediation should take into account 'perceived risks'.

8 ADDITIONAL INVESTIGATION AND REMEDIATION SCOPE AND INDICATIVE COSTS

8.1 Additional Investigations

Additional investigations are recommended to provide increased sampling densities to allow for hotspot detection and further delineation of contaminants present. The investigations should be conducted in accordance with the following.

- National Environment Protection (Assessment of Site Contamination) Measure (1999) (2013 revision); and
- Standards Australia (AS4482:2005) Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil.

Sampling and analytical programs should be designed to employ sampling densities, data quality objectives, and sampling methodologies outlined in the above documents. The additional investigations should target asbestos containing materials, fibrous asbestos/asbestos fines in soil, organochlorine pesticides and metals.

8.2 Remediation/Management Options

Based on the desktop review, site walkover and limited sampling program, it is considered likely that some form of contaminant management or remediation may be required. The nature of the remediation/management works would be dependent on the results of additional investigations, nature of the future site use, cost/benefit analysis and the appetite for risk of future site operators/owners. Remediation/management options are summarised in the following table.

Table K: Remediation Management Options Summary

Remediation/Management Option	Description
Encapsulation/Engineering Controls of Contaminated Materials On-site.	<p>Encapsulation of contaminated materials prevents complete exposure pathways from being formed. This method minimises waste disposal to landfill and is generally considered to be a more sustainable approach. Encapsulation of the material could be achieved through surface seals (concrete/bitumen), excavation and placement of the material within an in-ground containment cells or other engineering control. This remediation option may be undertaken without requiring the removal of the existing buildings.</p> <p>If future development of the site requires sealing of the sites surface, this method of remediation/management may be suitable for the site. However, as the contamination remains on-site, on-going management and maintenance is required to ensure the implemented engineering controls are preventing complete exposure pathways being formed.</p> <p>It should also be noted that if contaminated material is maintained on site, the site may need to be listed on the Queensland Environmental</p>

	Management Register and a Site Management Plan developed.
Excavation and Off-site Disposal of Contaminated Materials.	<p>Excavation and off-site disposal of contaminated soil would remove the potential risks associated with contaminated soil from the site. However this is likely to be the most costly remediation/management option as transport and landfill disposal fees will be incurred and would require the removal of site infrastructure/buildings.</p> <p>If a disposal permit for contaminated soil is required to move the contaminated material off-site, the site would need to be listed on the Queensland Environmental Management Register, however if the remediation works render the site suitable for unrestricted use, an application to the administering authority could be made to have the site removed from the EMR on completion of the remediation works.</p>

8.3 Indicative Costs

8.3.1 Additional Investigation

Indicative costs to complete additional investigations and remediation/management works are summarised in **Table L**.

Table L: Indicative Additional Investigation Costs

Additional Investigation Works	Indicative Cost (excluding GST)
Project Establishment and Management	\$ 2,162
Fieldwork	\$ 9,720
Laboratory Analyses	\$ 4,805
Reporting	\$ 11,319
Additional Investigation Works Total	\$ 28,006

8.3.2 Remediation Works

Estimated costs for remediation works cannot be accurately determined based on the Phase 1 investigation results. Further investigations are required to determine actual remediation requirements and information on the proposed future land use is required. Therefore, the remediation/management estimated costs below can only be considered indicative. Further detailed estimation of the remediation/management costs would be required post the recommended additional investigation works.

Table M: Indicative Remediation/Management Costs

Remediation/Management Option - On-site Encapsulation	Indicative Cost (excluding GST)
Project Establishment and Management	~\$ 3,400
Remediation Planning and Design	~\$ 7,600
Implementation of Engineering Controls	~\$ 55,000
Remediation and Validation Reporting	~\$ 12,000
Site Management Plan and Regulatory Liaison	~\$ 9,000
Remediation Management Option - On-site Encapsulation Total	~\$ 87,000

Remediation/Management Option - Off Site Disposal	Indicative Cost (excluding GST)
Project Establishment and Management	~\$ 3,400
Remediation Planning and Approvals	~\$ 9,000
Excavation and Disposal of Contaminated Soil	~\$ 63,600
Validation Sampling and Laboratory Analysis	~\$ 9,000
Remediation and Validation Reporting	~\$ 12,000
Regulatory Liaison and Statutory Fees	~\$ 8,000
Remediation/Management Option - Off Site Disposal Total	~\$ 105,000*

* = Off-site disposal remediation option does not include the costs associated with the removal of existing site infrastructure and buildings prior to remediation works.

9 CONCLUSIONS AND RECOMMENDATIONS

The Department of Veteran Affairs commissioned Coffey to undertake a Phase1 Contaminated Land Assessment of 114 Newdegate Street, Greenslopes, Queensland.

The site at the time of investigation was operated by the Australian Red Cross and included a community hall and a closed accommodation building located on the corner of Newdegate Street and Headfort Street, Greenslopes. The site was made up of three legal properties (Lots 123, 124 and 125 on RP46047).

9.1 Desk Top Review

The site and immediately surrounding properties were developed prior to the earliest available aerial photograph in 1944. The Commonwealth of Australia had interests in the property from as early as 1901 with a three year lease. The War Services Home Commissioner acquired the property in 1920 and the property was transferred to the current registered owner in 1950.

The properties, on which the site is located, are not contained on the Queensland Environmental Management Register and the Brisbane City Council do not hold any information in regards to dangerous goods/hazardous materials licences or environmental authorities associated with the site.

Representatives of the site operators (Australian Red Cross) were not aware of any spills or releases of hazardous contaminants, pest infestations, major refurbishments, building fires or storage of hazardous materials other than minor storage of cleaning chemicals and paints.

9.2 Site Walkover

The site walkover identified the following key potential risks.

- Fragments of asbestos containing materials were observed beneath both site buildings and within the front vegetated area. The fragments of asbestos containing materials observed were generally in poor condition and lying on the soil surface.
- Paint on the buildings was in poor condition and peeling and has the potential to contain lead and other metals.
- Evidence of former termite infestations was present underneath the southern building. Pesticides may have been used to remove the termite infestation.
- There is potential for pesticide use in the north eastern corner of the site where stressed vegetation was present and a neighbouring property had an orchid shade house.

9.3 Limited Soil Sampling Program

The limited soil sampling program identified the following.

- Concentrations of zinc detected in two of the four samples have the potential to impact on ecosystems in urban residential/public open spaces. The concentrations of zinc detected did not exceed the human health based investigations levels for standard residential environments. The zinc is anticipated to be associated with peeling paint and flecks of paint in the soil.

- Detectable concentrations of organochlorine pesticides were present in all four soil samples analysed. The organochlorine pesticides detected is consistent with historical treatment of pests such as termites. The concentrations of all organochlorine pesticides detected were below the nominated investigation levels and do not pose an unacceptable risk to current and future site users. However, it should be noted the limited nature of the sampling program (four surface soil samples only) does not provide adequate site coverage for hotspot detection.
- Asbestos fibres were detected in soil samples SS01 (0.007% weight/weight) and SS02 (0.02% weight/weight). These concentrations of asbestos fibres are above the recommended investigation level for fibrous asbestos or asbestos fines in soil for all site uses. Therefore, the detected concentrations have the potential to impact on current and future site users.

9.4 Site Conceptual Model and Qualitative Risk Assessment

The site conceptual model identified potentially complete exposure pathways to the following potential receptors.

- Australian Red Cross personnel.
- Community groups that use the site facilities.
- Maintenance contractors and caretakers.
- Future construction personnel.
- Future land users.
- Surrounding land users.

The qualitative risk assessment identified that maintenance contractors and caretakers, future construction personnel and potential future site users have a potential high risk associated with the pesticides and fibrous asbestos within the soil. Due to the potential for these receptors to disturb the soil profile releasing asbestos fibres and to come into contact with the soil, the likelihood of exposure is higher than that for other site users.

As the Australian Red Personnel have access to areas beneath the southern building and are more likely to access areas of the site where exposed soil is present, the qualitative risk assessment indicated they have a moderate risk. However, it should be noted that it is considered unlikely that exposure has or will occur.

The qualitative risk assessment indicated that all other identified receptors had a low risk primarily due to the limited access to contaminated areas.

9.5 Additional Investigations and Remediation/Management

Due to the presence of asbestos containing materials, asbestos fines within the soil and the detected concentrations of zinc and organochlorine pesticides, additional investigations have been recommended to provide greater sampling densities for hotspot detection and to provide additional information to allow more detailed assessment of risks. The additional investigations should be undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure and relevant Australian Standards. The assessment of asbestos risks should include both asbestos containing materials and asbestos fines in soil. The anticipated cost to complete the recommended investigation works is \$28,006 (excluding GST).

Any remediation or management of contaminated soil would be dependent on the results of the additional investigation works and proposed future site use. The remediation/management options identified include.

- Encapsulation/engineering controls of contaminated materials on-site – retention of the contaminated material on-site with placement of engineering controls to prevent access to contaminated material and therefore preventing complete exposure pathways being formed. The indicative cost to complete this remediation/management option is in the order of ~\$87,000 (excluding GST)
- Excavation and off-site disposal of contaminated material – removal of the contaminated soil from site to a licensed landfill for disposal. This remediation option would require the removal of the site infrastructure and building prior to remediation works being undertaken. The indicative cost to complete this remediation option, post the removal of the site infrastructure and buildings, is in the order of ~\$105,000 (excluding GST).

This report must not be reproduced except in full and must be read in conjunction with the 'Important Information about your Coffey Environmental Report'

10 REFERENCES

Department of Mapping and Surveying (1980) Topographic Map Mount Gravatt 1:25,000 (9542-44).

Department of Mines (1965) City of Brisbane Economic Geology Sheet 3 1:31,680.

National Environment Protection Council (1999) (2013 revision) National Environment Protection Measure – Assessment of Site Contamination.

Queensland Government (1987) 1:2,500,000 Groundwater Resources of Queensland Map (Hydrogeological Series 1987)

Standards Australia (HB203:2012) Environmental Risk Management – Principles and Process

Important information about Coffey Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey. The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Subsurface conditions can change Interpretation of factual data

Subsurface conditions are created by natural processes and the activity of man and may change with time. For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs

(assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Contact Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

Tables

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

Table 1
Soil Analytical Results -
Hydrocarbons (TRH, BTEX and PAH)
DVA Greenslopes
ENAU RHOD06233AA

Field_ID						SS01	SS02	SS03	SS04
Sample_Depth_Range (m)						0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Sampled_Date-Time						16/07/2013	16/07/2013	16/07/2013	16/07/2013
SampleCode						B13-JI12647	B13-JI12648	B13-JI12649	B13-JI12650
Analytes	Units	LOR	Nominated IL (1)	Nominated IL (2)	Nominated IL (3)				
BTEX COMPOUNDS									
Benzene	mg/kg	0.1	50	NE	0.5	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	85	NE	160	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	70	NE	57	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	NE	NE	NE	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1	NE	NE	NE	<0.1	<0.1	<0.1	<0.1
Xylenes	mg/kg	0.3	45	NE	40	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	NA (a)	NE	NE	NE	#	#	#	#
Napthalene	mg/kg	0.5	NE	NE	3	<0.5	<0.5	<0.5	<0.5
TRH - 2013 NEPM Fractions									
C6-C10	mg/kg	20	180	NE	44	<20	<20	<20	<20
C10 - C16	mg/kg	50	120	NE	110	<50	<50	<50	<50
C16 - C34	mg/kg	100	300	NE	NE	<100	<100	<100	260
C34 - C40	mg/kg	100	2800	NE	NE	<100	<100	<100	<100
Total TPH	mg/kg	NA (a)	NE	NE	NE	-	-	-	260
PAH									
Acenaphthene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	0.7	NE	NE	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Benzo[b+j]fluoranthene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5	NE	NE	NE	<0.5	<0.5	<0.5	<0.5
Total PAHs	mg/kg	0.5	NE	300	NE	<0.5	<0.5	<0.5	<0.5

Notes:

HA = Hand Auger Bore

"#" = All constituent analyte concentrations are below LOR.

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

NA = Not applicable

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

Nominated Investigation Levels:

(1) NEPM 1999 ESLs Urban residential and public open space, Fine Soil

(2) NEPM 1999 HSL-A Residential (Low Density)

(3) CRC CARE HSL-A, 0 to <1m, Sandy Soils for Vapour Intrusion

Results	Values in highlighted cells exceed nominated IL (1)
Results	Values in highlighted cells exceed nominated IL (2)
Results	Values in highlighted cells exceed nominated IL (3)

Table 2
Soil Analytical Results -
Metals and Asbestos
DVA Greenslopes
ENAU RHOD06233AA

Laboratory ID					SS01	SS02	SS03	SS04
Sample ID					0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Sample Depth (m)					16/07/2013	16/07/2013	16/07/2013	16/07/2013
Sample Date					B13-J112647	B13-J112648	B13-J112649	B13-J112650
Analytes	Units	LOR	Nominated ILs (1)	Nominated ILs (2)				
Metals								
Arsenic	mg/kg	2	100	100	32	10	16	10
Cadmium	mg/kg	0.4	NE	20	0.7	1.4	0.4	0.6
Chromium	mg/kg	5	190-400	NE	54	12	42	22
Copper	mg/kg	5	60-800	6000	21	27	20	33
Lead	mg/kg	5	1100	300	39	100	75	72
Mercury	mg/kg	0.1	NE	40	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	30-560	400	35	8.4	18	11
Zinc	mg/kg	5	70-1300	7400	760	2000	190	250
Asbestos								
Asbestos ID	% w/w	0.1 g/kg	NE	0.001% w/w	Chrysotile Asbestos Detected. Fibres approximate weight = 0.029g, sample weight = 440.0g (~0.007%w/w)	Chrysotile Asbestos Detected. Fibres approximate weight = 0.031g sample weight = 143.0g (~0.02%w/w)	No Asbestos Detected	No Asbestos Detected

HA = Hand Auger Bore

LOR = Limit of Reporting (= Method Detection Limit)

Nominated Investigation Levels:

(1) NEPM 1999 ESLs Urban residential and public open space, added contaminant levels.

(2) NEPM 1999 HILs Residential A Soil

Results
Results

Values in highlighted cells exceed nominated IL (1)

Values in highlighted cells exceed nominated IL (2)

Laboratory ID				SS01	SS02	SS03	SS04
Sample ID				0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Sample Collection Date				16/07/2013	16/07/2013	16/07/2013	16/07/2013
Sample Extraction Date				B13-J112647	B13-J112648	B13-J112649	B13-J112650
Analytes	Units	LOR	Nominated ILs (1)				
OCP							
4,4-DDE	mg/kg	0.05	NE	1.3	<0.05	0.09	<0.05
a-BHC	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05	NE	<0.05	<0.05	0.11	<0.05
b-BHC	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Chlordane	mg/kg	0.1	50	0.9	20	0.3	8.2
d-BHC	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
DDD	mg/kg	0.05	NE	1.7	<0.05	<0.05	<0.05
DDT	mg/kg	0.05	180	3.7	0.12	0.13	<0.05
DDT + DDE + DDD	mg/kg	0.15	240	6.7	<0.22	<0.27	<0.15
Dieldrin	mg/kg	0.05	NE	0.07	0.2	1.7	1.1
Aldrin + Dieldrin	mg/kg	0.1	6	<0.12	<0.25	1.81	1.15
Endosulfan I	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Endosulfan II	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Endosulfan sulphate	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05	10	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Endrin ketone	mg/kg	0.05	NE	<0.05	<0.05	0.07	<0.05
g-BHC (Lindane)	mg/kg	0.05	NE	<0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	6	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05	NE	<0.05	0.26	<0.05	0.24
Hexachlorobenzene	mg/kg	0.05	10	<0.05	<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.05	300	<0.05	<0.05	<0.05	<0.05
Toxaphene	mg/kg	0.1	20	<0.1	<0.1	<0.1	<0.1
OPP							
Azinophos methyl	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Bolstar (Sulprofos)	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos	mg/kg	0.2	160	<0.2	<0.2	<0.2	<0.2
Demeton-O	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Diazinon	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Dichlorvos	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Disulfoton	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Ethion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Ethoprop	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Fenitrothion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Fensulfothion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Fenthion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Merphos	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Methyl parathion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Mevinphos (Phosdrin)	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Naled (Dibrom)	mg/kg	0.5	NE	<0.5	<0.5	<0.5	<0.5
Phorate	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Ronnel	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Trichloronate	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2
Tokuthion	mg/kg	0.2	NE	<0.2	<0.2	<0.2	<0.2

Notes:

HA = Hand Auger Bore

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

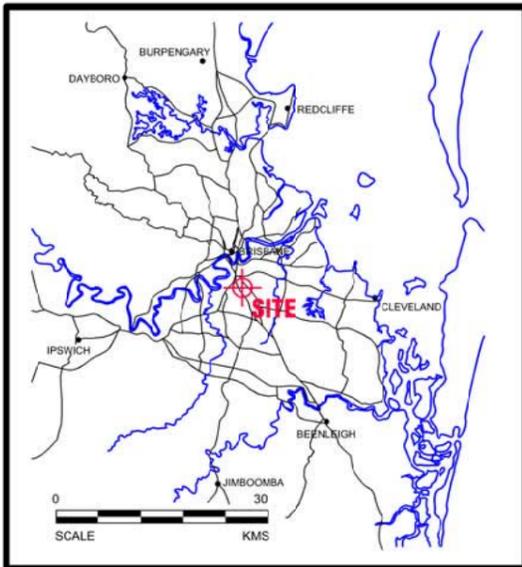
Nominated Investigation Level:

(1) NEPM 1999 Health Based Investigation Levels - Residential A

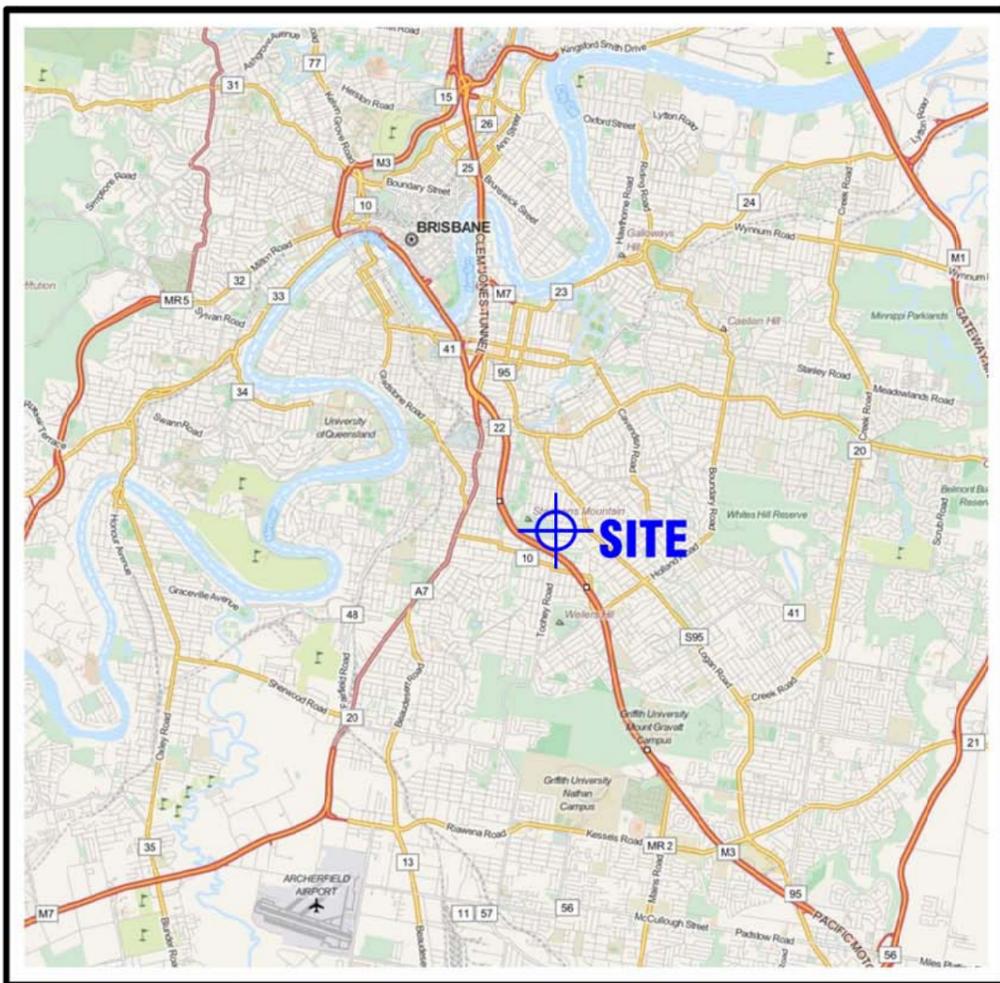
Results Values in highlighted cells exceed nominated IL (1)

Figures

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



GENERAL AREA MAP



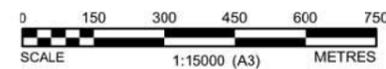
REGIONAL AREA MAP

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LOCAL AREA MAP

© OpenStreetMap contributors, CC-BY-SA



Coffey Environments Australia Pty Ltd

Rev	Date	Revision Details	Drn
A	31.07.13	ISSUE	LZ

coffey Level 2, 12 Creek St
Brisbane QLD 4000
Ph: (07) 3002 0400
Fax: (07) 3002 0444

Client:
DEPARTMENT OF VETERAN AFFAIRS

Project:
PHASE 1 CONTAMINATED LAND ASSESSMENT

Location:
114 NEWDEGATE STREET
GREENSLOPES, QLD

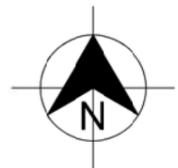
Drawing Title:
SITE LOCALITY PLAN

Drawn LZ	Date 31.07.13
Project - Drawing No. ENAUH006233AA-D01	Figure No. 1
	Rev. A



LEGEND

● SAMPLE LOCATIONS



NOTE:
ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES.

Coffey Environments Australia Pty Ltd ©

Rev	Date	Revision Details	Drn
A	31.07.13	ISSUE	LZ

coffey  Level 2, 12 Creek St
Brisbane QLD 4000
Ph: (07) 3002 0400
Fax: (07) 3002 0444

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DEPARTMENT OF VETERAN AFFAIRS

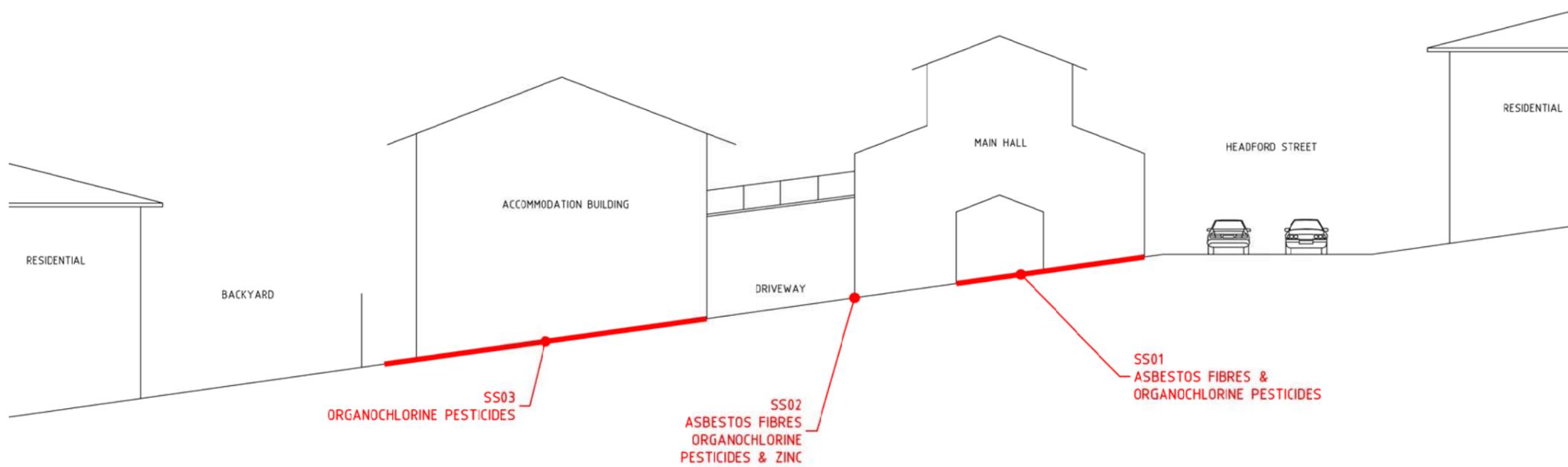
Project:
PHASE 1 CONTAMINATED LAND ASSESSMENT

Location:
114 NEWDEGATE STREET
GREENSLOPES, QLD

Drawing Title:
SITE FEATURES PLAN

Drawn LZ	Date 31.07.13
Project - Drawing No. ENAUH006233AA-D01	Figure No. 2
	Rev. A

THIS IS ONE INTERPRETATION ONLY
OTHER INTERPRETATIONS ARE POSSIBLE.



LEGEND

— ASBESTOS FRAGMENTS

THIS IS ONE INTERPRETATION ONLY
OTHER INTERPRETATIONS ARE POSSIBLE.

Coffey Environments Australia Pty Ltd

Rev	Date	Revision Details	Drn
A	31.07.13	ISSUE	LZ

coffey  Level 2, 12 Creek St
Brisbane QLD 4000
Ph: (07) 3002 0400
Fax: (07) 3002 0444

Client:
DEPARTMENT OF VETERAN AFFAIRS

Project:
PHASE 1 CONTAMINATED LAND ASSESSMENT

Location:
114 NEWDEGATE STREET
GREENSLOPES, QLD

Drawing Title:
SITE CONCEPTUAL MODEL

Drawn LZ	Date 31.07.13	Project - Drawing No. ENAUH006233AA-D01	Figure No. 3	Rev. A
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Appendix A Site Photographs

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



Photograph 1 – Southern Building containing the main hall.



Photograph 2 – Northern Building containing closed accommodation facilities.



Photograph 3 – Salt crusting beneath southern building.



Photograph 4 – Example of peeling external paint.



Photograph 5 – Stressed vegetation in the north east corner of the site.



Photograph 6 – Example of Asbestos containing material fragment.



Photograph 7 – Orchid shade house on property to east.



Photograph 8 – Greenslopes Private Hospital

Appendix B

Current and Historical Titles

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 16578491
Search Date: 17/07/2013 14:22

Title Reference: 12255073
Date Created: 07/12/1945

Previous Title: 11441181

REGISTERED OWNER

REPATRIATION COMMISSION

ESTATE AND LAND

Estate in Fee Simple

LOT 123 REGISTERED PLAN 46047
County of STANLEY Parish of BULIMBA
Local Government: BRISBANE CITY

LOT 124 REGISTERED PLAN 46047
County of STANLEY Parish of BULIMBA
Local Government: BRISBANE CITY

LOT 125 REGISTERED PLAN 46047
County of STANLEY Parish of BULIMBA
Local Government: BRISBANE CITY

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10196143 (POR 102A)
Deed of Grant No. 19506154 (POR 102)
2. LEASE No 700594425 06/04/1995 at 15:09
to
THE AUSTRALIAN RED CROSS SOCIETY, QUEENSLAND DIVISION
Original term commencing
01/01/1995
Terminating
31/12/1999
with options as therein stated over the whole of the land

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 05/07/1995 700724889 Certificate No. 3

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: External Supervisor

7574

VOL: S 9506 FOL: 154



19506154

1.]

NEW SOUTH WALES.

County Stanley

A. LAND PURCHASE.

58
1574

Parish Bulimba

Date of Purchase 29th December 1857

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—

Area 59 Acres

TO ALL to whom these Presents shall come, Greeting:—

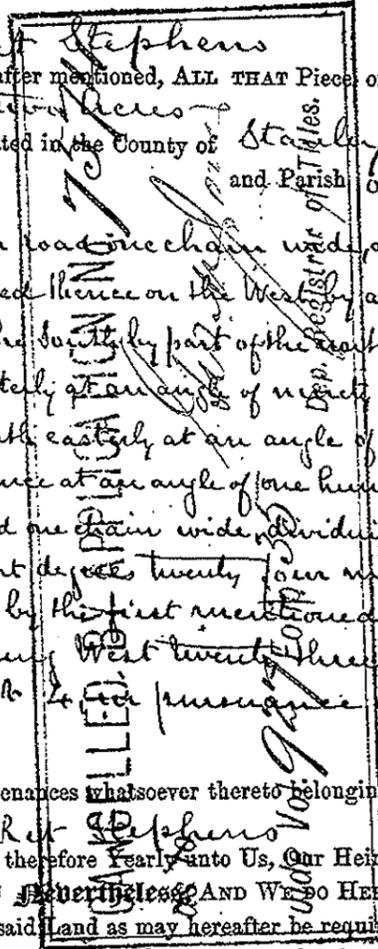
Received this 30th day of October 1858

WHEREAS in conformity with the Regulations now in force for the Sale of Crown Lands in Our Territory of NEW SOUTH WALES,

Thomas Blacket Stephens of Brisbane has become the Purchaser of the

Land hereinafter described, for the Sum of Fifty two pounds Sterling; **Now Know Ye**, That for and in consideration of the said Sum for and on Our behalf, well and truly paid into the Colonial Treasury of Our said Territory, before these Presents are issued, And in further consideration of the Quit-Rent hereinafter Reserved, WE, with the advice of OUR Executive Council of NEW SOUTH WALES, HAVE GRANTED, and for Us, Our Heirs and Successors, DO HEREBY GRANT unto the said

Thomas Blacket Stephens his Heirs and Assigns, Subject to the several and respective Reservations hereinafter mentioned, ALL THAT Piece or Parcel of Land in Our said Territory, containing by Admeasurement Fifty two Acres be the same more or less, situated in the County of Stanley



and Parish of Bulimba - Portion number one hundred and two - Commencing on a road one chain wide at the north east corner of Portion number one hundred and three, and bounded thence on the West by a line dividing it from that Portion, bearing South nineteen Chains forty links; on the South by part of the northern boundary of Portion number Eighty six in parish of Yerrapilly, being a line Easterly at an angle of ninety one degrees forty minutes with the West boundary six chains fifty five links; thence South Easterly at an angle of two hundred and fourteen degrees forty four minutes seven Chains sixty links; and thence at an angle of one hundred and fifty five degrees five minutes ten chains sixty one links; - on the East by a road one chain wide, dividing it from Portion number one hundred and one, northerly at an angle of seventy eight degrees twenty four minutes with the last boundary twenty six chains forty links; and on the north by the first mentioned road, dividing it from part of portion number one hundred and four, bearing West twenty three chains to the point of commencement - being the land sold as Lot 2, in pursuance of the proclamation of 2nd November 1857

with all the Rights and Appurtenances whatsoever thereto belonging: **To Hold** unto the said

Thomas Blacket Stephens his Heirs and Assigns for ever, YIELDING and Paying therefore Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded; **Provided Nevertheless** AND WE DO HEREBY RESERVE unto Us, Our Heirs and Successors, all such parts and so much of the said Land as may hereafter be required for making Public Ways, Canals, or Railroads, in, over, and through the same, to be set out by Our Governor for the time-being of Our said Territory, or some person by him authorised in that respect; AND ALSO, all Sand, Clay, Stone, Gravel, and Indigenous Timber, and all other Materials, the natural produce of the said Land, which may be required at any time or times hereafter, for the construction and repair of any Public Ways, Bridges, Canals, and Railroads, or any Fences, Embankments, Dams, Sewers, or Drains, necessary for the same, together with the right of taking and removing all such Materials; AND WE DO HEREBY FURTHER RESERVE unto Us, Our Heirs and Successors, the right of full and free ingress, egress, and regress, into, out of, and upon the said Land, for the several purposes aforesaid: **In Testimony Whereof**, We have caused this Our Grant to be Sealed with the Seal of Our said Territory.

WITNESS Our Trusty and Well-beloved SIR WILLIAM THOMAS DENISON, Knight Commander of the Most Honorable Order of the Bath, Governor General in and over all Our Colonies of NEW SOUTH WALES, TASMANIA, VICTORIA, SOUTH AUSTRALIA, and WESTERN AUSTRALIA, and Captain General and Governor-in-Chief of Our Territory of NEW SOUTH WALES and its Dependencies, at Government House, Sydney, in NEW SOUTH WALES aforesaid, this Thirtieth day of April in the Twenty first Year of Our Reign; And in the Year of Our Lord One Thousand eight hundred and fifty-eight

L.S. (Signed)

FULLY CANCELLED
2nd APR 1875
Denison
H. J. H. H.

In F. 13th Sept 1858

To all to whom these presents shall come Greeting: Whereas the area and the description as written in the within deed of Grant are erroneous and it is intended to correct the same. Now know ye that I Charles Wallace Alexander Napier Baron Lamington Knight Commander of the most distinguished Order of St Michael and St George Governor and Commander in Chief of the Colony of Queensland and its dependencies by virtue of "The Titles to Land Act of 1858" do hereby declare that the area "Fifty two acres one rood twenty seven perches" be read and taken as substituted for the area "Fifty two acres" in the within grant and in every deed containing the said erroneous area. Also that the following description be read and taken as substituted for the description in the within grant and in every deed containing the said erroneous description that is to say: Commencing at the northeast corner of portion one hundred and three and bounded thence on the west by that portion bearing 180 degrees 7 minutes nineteen chains and forty links, on the south by portion eighty six parish of Geelong fully bearing 91 degrees 47 minutes six chains and fifty five links, on the southwest by that portion bearing 126 degrees 31 minutes seven chains and sixty links and 101 degrees 33 minutes ten chains and sixty three and seven tenths links, on the east by a line bearing north twenty six chains and thirty two and four tenths links and on the north by a line bearing 269 degrees 50 minutes twenty three chains and four links to the point of commencement. as shown on plan of survey deposited in the Surveyor General's Office.

Given under my hand and the seal of the said Colony at Government House Brisbane this third day of August in the year of our Lord one thousand eight hundred and ninety seven

(sgd) Lamington

By His Excellency's Command
(sgd) J. S. Foxton

Ms 115 B

L.S.

Entered in the Register of Errors in Deeds Book 5 page 447 in the Surveyor General's Office Brisbane
this fourth day of August A.D. 1897.

(sgd) J. H. Perce
Chief Clerk

Entry of correction made this 9 day of August 1897

Allen E. Holman
Dep Registrar of Titles

956/184

VOL: S 927 FOL: 35



10927035

No. 150045

d No. 3880

(C)

QUEENSLAND.



No. OF APPLICATION 2/5/11.

REGISTER BOOK, VOL. 927 FOLIO 35

CERTIFICATE OF TITLE.

Anne Stephens

of Wristan, Widow is now seized of an Estate in Fee Simple, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in All that piece of Land situated in the County of Stanley Parish of Billimba.

Being Portion One hundred and two containing by admeasurement fifty-two acres, one rood, twenty-seven perches more or less, commencing at the North-East corner of Portion one hundred and three and bounded thence on the West by that Portion bearing 180° 4' minutes chains forty links on the South by Portion eight six Parish of Yeerongpilly bearing 91° 14' 51" chains fifty-five links on the South-West by that Portion bearing 126° 31' seven chains sixty links and 101° 33' ten chains fifty-three links and seven tenths of a link on the East by a line bearing North twenty-six chains thirty-two links and four tenths of a link and on the North by a line bearing 269° 50' twenty-three chains four links to the Point of commencement

which said piece of Land is the whole of the portion marked 102 delineated in the Public Map of the said Parish deposited in the Office of the Surveyor-General, originally granted the thirteenth day of April 1858 by Deed of Grant No. 58/154 under the Seal of the Colony of New South Wales and the Hand of Sir William Thomas Denison, Bt. Governor of the said Colony, to Thomas Mackay Stephens.

Saving Allways to the Crown all the rights and interests reserved to it by the said Deed of Grant.

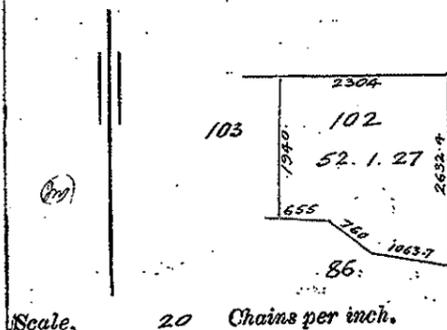
IN WITNESS whereof, I have hereunto signed my name and affixed my seal this fourteenth day of October One thousand eight hundred and ninety-seven.

Signed, Sealed, and Delivered, the 14 day of October 1897, in presence of }
R Mills

J. Brown
REGISTRAR OF TITLES.



Parish of Billimba



No. 3/2667 Bill of Mortgage produced 22 Oct 1897 at 11.57 a.m. registered 12 Nov 1897 from Anne Stephens to The Australasian Mortgage and Investment Society principal sum secured fourteen thousand pounds, repayable in three equal interest at the rate of 25/10 per centum per annum payable quarterly

Dep. Registrar of Titles.

No. 291798 LEASE produced 24 July 1903
 at 3.13 p.m. registered 11th Sep 1903 from
 Anne Stephens to the Commonwealth
 of Australia

Term 3 years from 1 Jan 1901
 Rental £10 per annum payable yearly
 Consent of mortgagee endorsed

M. K. White
 Dep. Registrar of Titles.

291798
 11/7/03

NEW TITLE No. 123871A
 PURSUANT to Memo. of TRANSFER No. 405936 Produced
 25 Aug 1904 at 2.56 p.m. Regd. 1 Sep 1904
 Stephens Estates Limited

OF 10 now SEISED of an Estate IN FEE
 SIMPLE in the WHOLE of the within land.
 Subject to Mortgage No. 313667

Witness:
R. Mills
 Registrar of Titles.

No. 410399 Bill of Mortgage produced 3 Jan 1905
 at 3.31 p.m. registered 29 Jan 1906
 from Stephens Estates Limited

to THE AUSTRALIAN MUTUAL PROVIDENT SOCIETY,
 principal sum secured Fourteen thousand
 and further advances repayable 7 Feb 1910.
 Interest at the rate of 6 per centum
 per annum payable quarterly

H. R. Baker
 Dep. Registrar of Titles.

No. 56832 TRANSFER of 46 acs 26 pchs sub 1
 War Service Homes Commissioner produced
 20 Dec 1919 at 10.26 AM registered 29 Jan 1920

Cancelled as above vide
 Vol. 1441 Fol. 181
J. Baynes
 Dep. Registrar of Titles.

997776
 sub 2
 12-11-26
 16-12-26
 25-1-27
 17-2-27
 A13406
 22-3-27

No. 997776 TRANSFER of 6 acs 39 pchs sub 2
 to Allen Hall

Produced
 20 Oct 1926 at noon registered 13 May 1927
 Cancelled as above vide Vol. 1703 Fol. 37

L. Bruffin
 REGISTRAR OF TITLES

FULLY CANCELLED

No 24383

QUEENSLAND.

143

County Stanley

Parishes Bulimba

and Yeerongpilly

A. LAND PURCHASE.

Date of Purchase } 17th July 1872

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—

Area 4 ac. Or. 32 p.

TO ALL to whom these Presents shall come, Greeting:—

WHEREAS, in conformity with the Regulations now in force for the Sale of Crown Lands in Our Territory of Queensland, Thomas

Blacket Stephens of Brisbane has become the Purchaser of the Land hereinafter described, for the Sum of Four pounds four shillings Sterling.

Now Know Ye, That for and in consideration of the said Sum, for and on Our behalf well and truly paid into the Colonial Treasury of Our said Territory, before these Presents are issued, And in further consideration of the Quit-Rent hereinafter reserved, We, with the advice of Our Executive Council of Queensland, have granted, and for Us, Our Heirs and Successors, do hereby Grant unto the said Thomas Blacket Stephens his Heirs and Assigns, subject to the several and respective Reservations hereinafter mentioned, All that Piece or Parcel of Land in Our said Territory, containing by Admeasurement Four acres and thirty two perches be the same more or less, situated in the County of Stanley and Parish of Bulimba and Yeerongpilly

Portion one hundred and two A: commencing at the northwest corner of portion one hundred and one and bounded thence on the north by a line bearing west one chain on the west by portions one hundred and two and eighty six bearing south forty two chains on the south by a line bearing east one chain and on the east by portions eighty seven and one hundred and one bearing north forty two chains to the point of commencement Being the land purchased by the said Thomas Blacket Stephens under the 29th clause of the Crown Lands Alienation Act of 1868

To Hold unto the said Thomas Blacket Stephens with all the Rights and Appurtenances whatsoever thereto belonging: his Heirs and Assigns for ever,

Yielding and paying therefor Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded: Provided Nevertheless, and We do hereby Reserve unto Us, Our Heirs and Successors, all such parts and so much of the said Land as may hereafter be required for making Public Ways, Canals, or Railroads, in, over, and through the same, to be set out by Our Governor for the time being of Our said Territory, or some person by him authorised in that respect; And also all Sand, Clay, Stone, Gravel, and Indigenous Timber, and all other Materials, the natural produce of the said Land, which may be required at any time or times hereafter for the construction and repair of any Public Ways, Bridges, Canals, and Railroads, or any Fences, Embankments, Dams, Sewers, or Drains, necessary for the same, together with the right of taking and removing all such Materials; And We do hereby further Reserve unto Us, Our Heirs and Successors, the right of full and free ingress, egress, and regress, into, out of, and upon the said Land, for the several purposes aforesaid: In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said Territory.

WITNESS Our Right Trusty and Entirely-beloved Cousin and Councillor GEORGE AUGUSTUS CONSTANTINE, Marquis of Normandy, Governor of the Colony of Queensland and its Dependencies, at Government House, Brisbane, in QUEENSLAND aforesaid, this fifth day of January in the thirtysixth Year of Our Reign; and in the Year of Our Lord One Thousand Eight Hundred and Seventythree.

VOL: 5 196 FOL: 143



10196143

ENTERED in the Register Book, Vol. 196, Folio 143, this eighteenth day of January 1873.

REGISTRAR-GENERAL

No. 51365 Transmission by Death. In consequence of the death of Thomas Blacket Stephens upon the 26th day of August 1877 his estate in the within land became transmitted to Anne Stephens of South Brisbane his widow the devisee named in the Will of the said deceased dated the 12th day of May 1875 as appears by the base copy of thereof and the declaration of the said devisee produced 19th February 1878 at 2.41 pm

Witnessed 16 April 1878
W. Mitchell
 P102A Bulimba 44 pilly Reg. Genl.

NEW TITLE No. 133895a
 PURSUANT to Memo. of TRANSFER No. 405936 Produced
 5 Aug 1878 at 2.56 p.m. Regd. 1 Sep 1878
 — Stephens Estates Limited —
 OF ——— now SEISED of an Estate IN FEE
 SIMPLE in the WHOLE of the within land.
 Witness: *R. Mills* *W. Mitchell*
 Registrar of Titles.

No. 570825 TRANSFER of 1 ac 1 rd 3 pchs sub 1A
 to James Peter Haugh and Annie Haugh
 produced
 22 Aug 1913 at 3.45 pm registered 20 Sep 1913
 Connected as above vide
 Vol. 1253 Fol 84
J. W. Haugh
 Dep. Registrar of Titles.

670825
 vol 85
 29/8/13
 4/9/13

No. 726822 TRANSFER of 2 ac 1 rd sub 1
 to Water Service Homes Commissioner
 20 Dec 19 10.26 AM registered 27 Jan 20
 Witness: *J. Bagnard*
 Dep. Registrar of Titles.

Rec
 997776
 2002
 12-11-26
 16-12-26
 25-1-27
 17-2-27
 (113406)
 22-3-27

No. 757476 TRANSFER of 1 rd 21 7/10 pchs sub 2
 to Ellen Hall
 20 Oct 6 noon 13 May 7
 1703 37
R. Bagnard
 Registrar of Titles.

FULLY CANCELLED

Certificate of Title.

VOL: S 1441 FOL: 181



11441181

a No. 17923

QUEENSLAND

No. 255691



(C)

REFERENCE TO PREVIOUS 196 143
VOL. s 927 FOLIO s 35
1367 105

REGISTER BOOK, VOL. 1441 FOLIO 181

WAR SERVICE HOMES COMMISSIONER

of _____ pursuant to Memorandum
of Conveyance No. 756832 produced the twentieth day of December 19 19,
registered the twenty ninth day of January 1920, is now seized _____ of an Estate
in Fee-simple, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in all that piece
of Land situated in the County of Stanley Parish of Bulimba
containing forty eight acres three roods five perches and nine tenths of a perch

more or less, as shown on the Plan hereon, and therein edged red, Being subdivision 1 of portions 102 and 102A
and subdivision 37 and 38 of portion 101 on Plans Cat. Nos. B15 - 520 and 700 deposited in the
office of the Registrar of Titles Brisbane
which said piece of Land is part _____ of the portions _____ marked 102, 102A and 101 delineated in the Public Map
of the said parish deposited in the Office of the Surveyor-General, originally granted by Deeds of Grant
No.s (Por. 102 and 102A) 58/154 and 24383 to Thomas Blacket Stephens
(Por. 101) 4851 to James Toohy.

Having Always to the Crown all the rights and interests reserved to it by the said Deeds of Grant.

In WITNESS whereof, I have hereunto signed my name and affixed my seal, this Twentieth
day of February One thousand nine hundred and twenty _____

Signed, Sealed, and Delivered, the _____
day of February 19 20 in presence of

[Signature]



[Signature]
REGISTRAR OF TITLES

No. 1354007 Part of the within land has been
dedicated for road purposes under Plan Cat.
No. 1354007. Produced 11 July 1928 at 3.0 pm
Registered 3 Jan 1929
[Signature]
REGISTRAR OF TITLES

No. 1354009 TRANSFER of 99/100 parts of Sub 1 of
Part 102
to Brisbane City Council Produced
16 Nov. 1928 at 10.20 am registered 21 Jan 1929
Cancelled as above vide Vol. 700 Fol. 227
[Signature]
REGISTRAR OF TITLES

No. 1354009 TRANSFER of 26 56/100 parts
Resub 112
Leslie George Blank Produced
14 Dec 1937 at 11.54 am registered 20 Dec 1937
Cancelled as above vide Vol. 3016 Fol. 174
[Signature]
REGISTRAR OF TITLES

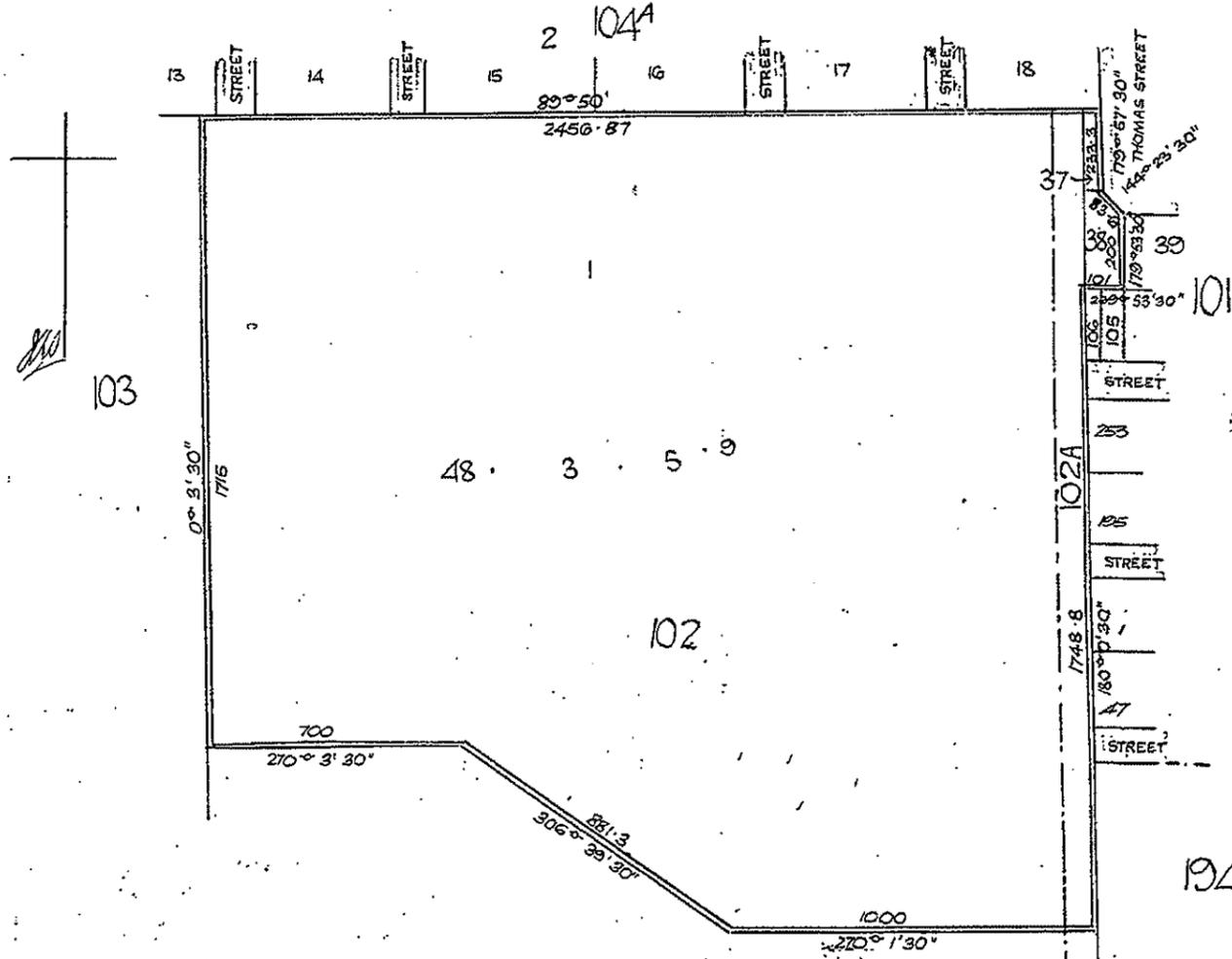
Scale, _____ chains per inch.

[Handwritten notes]
Ed/Dod
19.28.1

[Handwritten notes]
Case
160408
19.28
withdrawn
15.11.28

[Handwritten notes]
Plan
160409

[Handwritten notes]
1354009
Keller



Scale - 4 chains per inch.

No. A422436 TRANSFER of 25 2/100 pchs Resub 132 of sub 1 of Por 102 to Frank Gordon Stirling and Edna Joan Agnes Mary Stirling Produced 7 Oct 1942 at 9:56 AM registered 2 Oct 1942 Canceled as above vide Vol. 2087 Fol. 72

John R. M. Shie
REGISTRAR OF TITLES

ABEYANCE
No. A493760 1941

No. A493760 TRANSFER of 16 aces and 20 1/100 pchs to the Commonwealth of Australia Produced 16 Sept 1941 at 2:47 PM registered 25 Sept 1941 Canceled as above vide Vol. 2160 Fol. 25, 26, 27

Thomson
Acting REGISTRAR OF TITLES

No. A518738 TRANSFER of 26 2/100 pchs Res 129 of sub 1 of Por 102 to Frank William Ballard Produced 10 July 1942 at 2:24 PM registered 14 July 1942 Canceled as above vide Vol. 2162 Fol. 77

Thomson
REGISTRAR OF TITLES

No. A602624 TRANSFER of 29 1/100 pchs Resub 15 of sub 1 of Por 102 to John James Banning Produced 11 Apr 1945 at 2:25 PM registered 21 June 1945 Canceled as above vide Vol. 2247 Fol. 1011

Thomson
REGISTRAR OF TITLES

No. A604775 TRANSFER of 25 2/100 pchs Resub 118 of sub 1 of Por 102 to Charles Kelso Kraham Produced 20 May 1945 at 2:10 PM registered 21 June 1945 Canceled as above vide Vol. 2247 Fol. 1026

Thomson
REGISTRAR OF TITLES

No. A604777 TRANSFER of 25 6/100 pchs Resub 103 of sub 1 of Por 102 and 102 to Jeffery Stalks Produced 20 May 1945 at 2:10 PM registered 21 June 1945 Canceled as above vide Vol. 2247 Fol. 1023

Thomson
REGISTRAR OF TITLES

No. A606884 TRANSFER of 25 3/100 pchs Resub 109 of sub 1 of Por 102 to Gordon Holloway Adie Produced 23 May 1945 at 3:20 PM registered 21 June 1945 Canceled as above vide Vol. 2247 Fol. 1062

Thomson
REGISTRAR OF TITLES

No. A615358 TRANSFER of 1 rd 36 1/100 pchs Resub 123, 124 and 125 of sub 1 of Por 102 and 102A to the Commonwealth of Australia Produced 30 July 1945 at 3:41 PM registered 14 Sept 1945 Canceled as above vide Vol. 2255 Fol. 73

Thomson
REGISTRAR OF TITLES

No. A627992 TRANSFER of 25 1/100 pchs Resub 117 of sub 1 of Por 102 to George Lucas Produced 2 Nov 1945 at 2:4 AM registered 7 Jan 1946 Canceled as above vide Vol. 2266 Fol. 1467

Thomson
REGISTRAR OF TITLES

Handwritten notes:
A422436
R132
A493760
R20154
55143
841108
A518738
R129
(from A518739)
Con
A602624
P2015
Q2m
(A602633)
Con
A604775
P20118
Q3m
(A604776)
Con
A604777
P20128
Q2m
(A604778)
Con
A606884
P20109
Q3m
(A606885)
Con
A615358
P20137/5

Handwritten notes:
24
A6319
K114

Annexed to Certificate of Title No 255691 Vol 1441 Folio 181 this 22nd day of Feb 1946 for the purpose of recording memorials

Thompson
REGISTRAR OF TITLES

No. A637967 TRANSFER of 26^{5/10} pchs Resub 114 of Sub 1 of Por 102^A to *John Henry Richards* Produced 29 Jan 1946 at 10.00am registered 22 Feb 1946 Canceled as above vide Vol 2372 Fol 23

No. A931506 TRANSFER of 29^{1/10} pchs Resub 12 of Sub 1 of Por 102 to *Charles Joseph Teck and Thyllis Teck* Produced 10 May 1950 at 11.00am registered 26 May 1950 Canceled as above vide Vol 2533 Fol 18

No. A65426 TRANSFER of 26^{7/10} pchs Resub 130 of Sub 1 of Por 102A to *Pray William Chanter* Produced 1 May 1946 at 9.45a.m. registered 14 May 1946 Canceled as above vide Vol 2283 Fol 167

No. B15840 TRANSFER of 26^{3/10} pchs Resub 122 to *Charles Maurice Penny and Rose Salma May Penny* Produced 17 Apr 1951 at 9.30am registered 3 May 1951 Canceled as above vide Vol 2610 Fol 200

No. A659026 TRANSFER of 25^{5/10} pchs Res 120 to *Arthur James Hurst* Produced 5 June 1946 at 2.15PM registered 25 June 1946 Canceled as above vide Vol 2488 Fol 223

No. B26074 TRANSFER of 25^{9/10} pchs Resub 16 to *Colin James Hoy and Catherine Hilling Hoy* Produced 31 May 1951 at 9.20am registered 13 July 1951 Canceled as above vide Vol 2622 Fol 7

No. A780382 TRANSFER of 25^{5/10} pchs Resub 119 to *Samuel Raymond Ramsden* Produced 6 Apr 1947 at 2.30pm registered 6 May 1948 Canceled as above vide Vol 2408 Fol 41

No. B20531 TRANSFER of 25^{1/10} pchs Resub 131 to *Ray Gordon Abraham and Joan Grace Abraham* Produced 12 June 1951 at 1.30pm registered 6 Aug 1951 Canceled as above vide Vol 2625 Fol 74

No. A831982 TRANSFER of 25^{2/10} pchs Resub 126 to *Raymond Edwin Roberts* Produced 27 Feb 1947 at 12.12pm registered 4 Feb 1949 Canceled as above vide Vol 2452 Fol 208

No. B20585 TRANSFER of 20^{1/10} pchs Resub 18 to *William Martin Barnes and Grace Ethel Barnes* Produced 3 July 1951 at 1.25pm registered 6 Aug 1951 Canceled as above vide Vol 2625 Fol 73

No. A94442 TRANSFER of 10 acs 15^{3/10} pchs Resub 2 and 134 to 173 to *Repatriation Commission* Produced 16 Feb 1950 at 9.30am registered 25 May 1950 Canceled as above vide Vol 2534 Fol 247 to 250

No. B4664 TRANSFER of 29^{3/10} pchs Resub 146 to *Henry Francis and Dorothy Francis* Produced 3 Sep 1951 at 9.30am registered 27 Sep 1951 Canceled as above vide Vol 2640 Fol 101

No. A925748 TRANSFER of 30^{7/10} pchs Resub 14 of Sub 1 to *Ronald William Joseph Salmon and Palma Maria Salmon* Produced 13 Apr 1950 at 9.15am registered 15 May 1950 Canceled as above vide Vol 2535 Fol 17

No. B4679 TRANSFER of 29^{3/10} pchs Resub 146 to *Henry Francis and Dorothy Francis* Produced 3 Sep 1951 at 9.30am registered 27 Sep 1951 Canceled as above vide Vol 2640 Fol 101

Thompson
REGISTRAR OF TITLES
A65426
A637967
A659026
A780382
A831982
A94442
A925748
B15840
B26074
B20531
B20585
B4664
B4679
Plain
108079
D1/101/102A
B15340
R117
26100
(B15341)

No. B63290 TRANSFER of 25²⁸/₁₀₀ pchs. Result 133
 to Stanley Keith Nelms
 and Edna May Nelms Produced
 26 Oct 1951 at 9.20 am, registered 13 Nov 1951
 Cancelled as above vide Vol. 2649, Fol. 232

No. B83224 TRANSFER of 26⁷⁰/₁₀₀ pchs. Result 1
 to Harold John Alfred Wright
 and Pauline Ruby Wright Produced
 8 Feb 1952 at 3.45 p.m., registered 18 Feb 1952
 Cancelled as above vide Vol. 2646, Fol. 172

No. B88621 TRANSFER of 25⁶⁰/₁₀₀ pchs. Result 110
 to Muriel Grace Beatfield Produced
 5 Mar 1952 at 9.30 am, registered 12 Mar 1952
 Cancelled as above vide Vol. 2671, Fol. 184

No. B91043 TRANSFER of 30⁵⁰/₁₀₀ pchs. Result 5
 to Colin Valentine Enders Produced
 17 Mar 1952 at 1.44 p.m., registered 28 Mar 1952
 Cancelled as above vide Vol. 2674, Fol. 25

No. B97572 TRANSFER of 1rd 5⁹⁰/₁₀₀ pchs. Result 10
 to Roy Ernest Giedemann
 and Laura Frances Giedemann Produced
 17 Apr 1952 at 1.10 p.m., registered 4 June 1952
 Cancelled as above vide Vol. 2688, Fol. 137

No. B89205 TRANSFER of 27⁵⁰/₁₀₀ pchs. Result 3
 to Terence Wilfred Siddle and
 Mollie Elva Siddle Produced
 7 Mar 1952 at 9.20 a.m., registered 29 July 1952
 Cancelled as above vide Vol. 2699, Fol. 6

No. B119818 TRANSFER of 29⁵⁰/₁₀₀ pchs. Result 19
 to George Henry Pearce Produced
 10 Aug 1952 at 1.00 a.m., registered 21 Aug 1952
 Cancelled as above vide Vol. 2704, Fol. 25

low
 B26075 (R.19)
 note (B26075) mpc
 R116 (B119818)
 R19 abt 8/9/52
 low
 B28531 (Con mtd) (B122512)
 R171 R3 abt 1/9/52
 note (B28531) mpc abt 14/1/52
 low
 B34586 (Con mtd) (B122513)
 R18 abt 14/1/52
 note (B34586) low
 low
 B49665 (B45035)
 R16 R4
 note (B49665) low
 low
 B54027 (B147023)
 end R116 R113
 low
 B63291 (B147023)
 note low
 low
 B83224 (B161790)
 R1 note
 note (B83224) low
 low
 B89205 (R110) (mtp) (B89205)
 low
 B119818 (B119818)
 low
 B119818 (B119818)
 low
 B119818 (B119818)
 low
 B119818 (B119818)

No. B145034 TRANSFER of 27⁵⁰/₁₀₀ pchs. Result 1
 to 28 William James 28/1/52
 and Judith Ann 28/1/52
 10 Dec 1952 at 10.30 a.m., registered 30 Nov 1952
 Cancelled as above vide Vol. 2710, Fol. 11

No. B10222 TRANSFER of 32⁵⁰/₁₀₀ pchs. Result 118
 to Michael Alfred Ryan
 and Elizabeth Ryan Produced
 19 Mar 1952 at 1.10 p.m., registered 10 Apr 1952
 Cancelled as above vide Vol. 2671, Fol. 184

No. B114189 TRANSFER of 30⁵⁰/₁₀₀ pchs. Result 8
 to Colin Richard Giedemann
 Produced
 6 Mar 1953 at 2.30 p.m., registered 21 March 1953
 Cancelled as above vide Vol. 2716, Fol. 31

B119818
 R13
 low
 B119818
 R13

Annexed to Certificate of Title No. 255691. Vol. 1441 Fol. 181 this 22 day of July 1953 for the purpose of recording memorials

Thomson
REGISTRAR OF TITLES



No. B189092 TRANSFER of 30 7/100 pchs. Resub-13
to Henry George Curtain and Mary Mitchell
Curtain Produced
30 June 1953 at 3:30 p.m., registered 22 July 1953
Cancelled as above vide Vol. 2768 Fol. 142

Thomson
REGISTRAR OF TITLES

Leon
w/d of 1/4/55
B33006
511 abey B33006
15.4.55
Mly
B33006
w/d of 1/4/55

THE DESCRIPTION OF THE WITHIN LAND IS CONVERTED
TO LOT(S) 6

ON REGISTERED PLAN No. 46047

17 APR 1986 *Thomson*
REGISTRAR OF TITLES

No. B351216 TRANSFER of 35 2/100 pchs. Resub-11 to
Alfred Edward Phillip Gunnar and
Kathleen Veronica Gunnar Produced
6 July 1955 at 11 a.m., registered 20 July 1955
Cancelled as above vide Vol. 2922 Fol. 514

Thomson
REGISTRAR OF TITLES

B351216
R115 of 21.6.55
Mly
B329854

TRANSFER of Lot 6, R.P. 46047
to Perry Arthur Baker
No. B250178 PRODUCED 6 May 1977
REGD. 18 of 61 of P102

Vol. 7048
Fol. 31

3 AUG 1987 *Thomson*
REGISTRAR OF TITLES

No. B329353 TRANSFER of 25 2/100 pchs. Resub 115
of Sub 1 of Para 102 and 102 A to Thomas Joseph
Renehan and Jean Marie Renehan Produced
23 Mar 1955 at 10:30 a.m., registered 16 Aug 1955
Cancelled as above vide Vol. 2930 Fol. 99

Thomson
REGISTRAR OF TITLES

Plan
(PP476)
B512147
1977

NOTE
Re Subs
134 to 173
transferred
vide
Vol 2534
Fols 248/252

Resub 121
see
Vol 3201
Fol 14

No. B444966 TRANSFER of 1/20 23 7/100 pchs
Resub 177 to Colin Hilton Ford
and Evelyn Florence Ford Produced
25 Oct 1956 at 2:50 p.m., registered 12 Nov 1956
Cancelled as above vide Vol. 3015 Fol. 76

Thomson
REGISTRAR OF TITLES

Vol 2
4890
Con
B528940
3174 to 176
of 178
Req

No. B528940 TRANSFER of Lot 1 and 37 3/100 pchs
Resubs 174 to 176 and 178 to Paul Arthur
Robertson Produced
5 Dec 1957 at 1:30 p.m., registered 2 Jan 1958
Cancelled as above vide Vol. 3094 Fol. 52

Thomson
REGISTRAR OF TITLES

B528940
R79, 17, 11, 11, 11, 17
aly 19/11/58
JN 5125047B
(Resub 6)

NOTE
It appears that Resub
6 is still in this deed

No. B298259 REQUEST to issue Certificate of Title for
1 ad Ouds 16 5/8 pchs Resub 7, 9, 17
11, 12, 7 and 8
Produced 13 Oct 1958 at 9:15 a.m., registered 4 Feb 1959
Cancelled as above vide Vol. 3201 Fol. 14-19

R.M. Miller
ACTING REGISTRAR OF TITLES

Appendix C Registered Plan

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

THE ABOVE... I have faithfully... and I make... to be true, and by virtue of...

A 60469

Resub 361 See Plan 121557
Road 117 Sec 16 N 23 E
Resub 162-173 See Plan No 95512
Closure of Peach St (Por 57) See DG Vol 387 Pl 72
Resub 10 See Plan No 128869
Resub 123-125
Road 204-208
Resub 2
LOT 17 S85 159515

Resub. 2.
12914

103

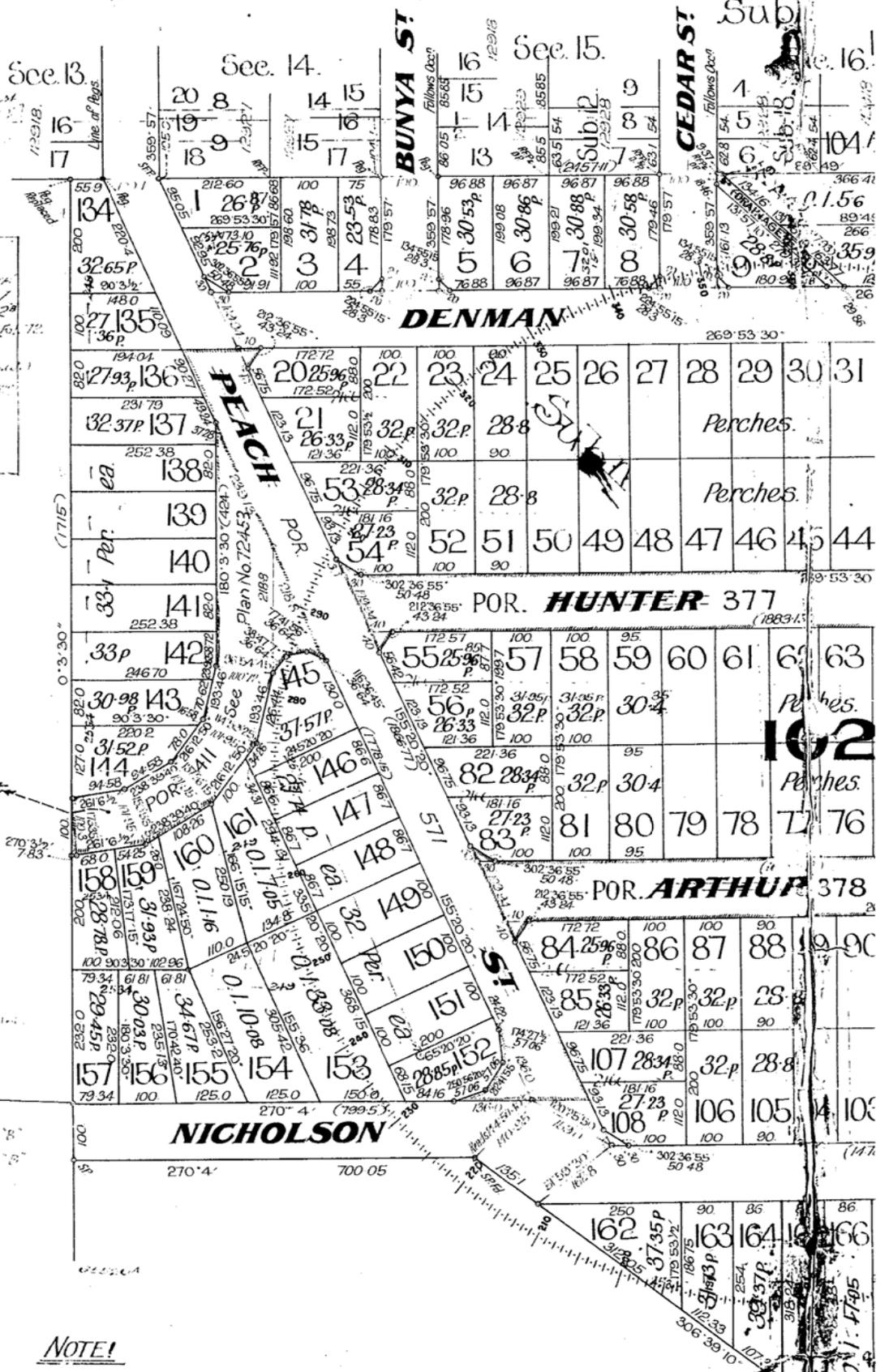
32994

5.574
(200 - 100)

Sub 2

124016

Resub. 3.
43118



NOTE!
G.I. Pins are inserted at positions marked with red circle.

For Additional Plan & Document Notings Refer to C&P

Road Devt No A. 60407.

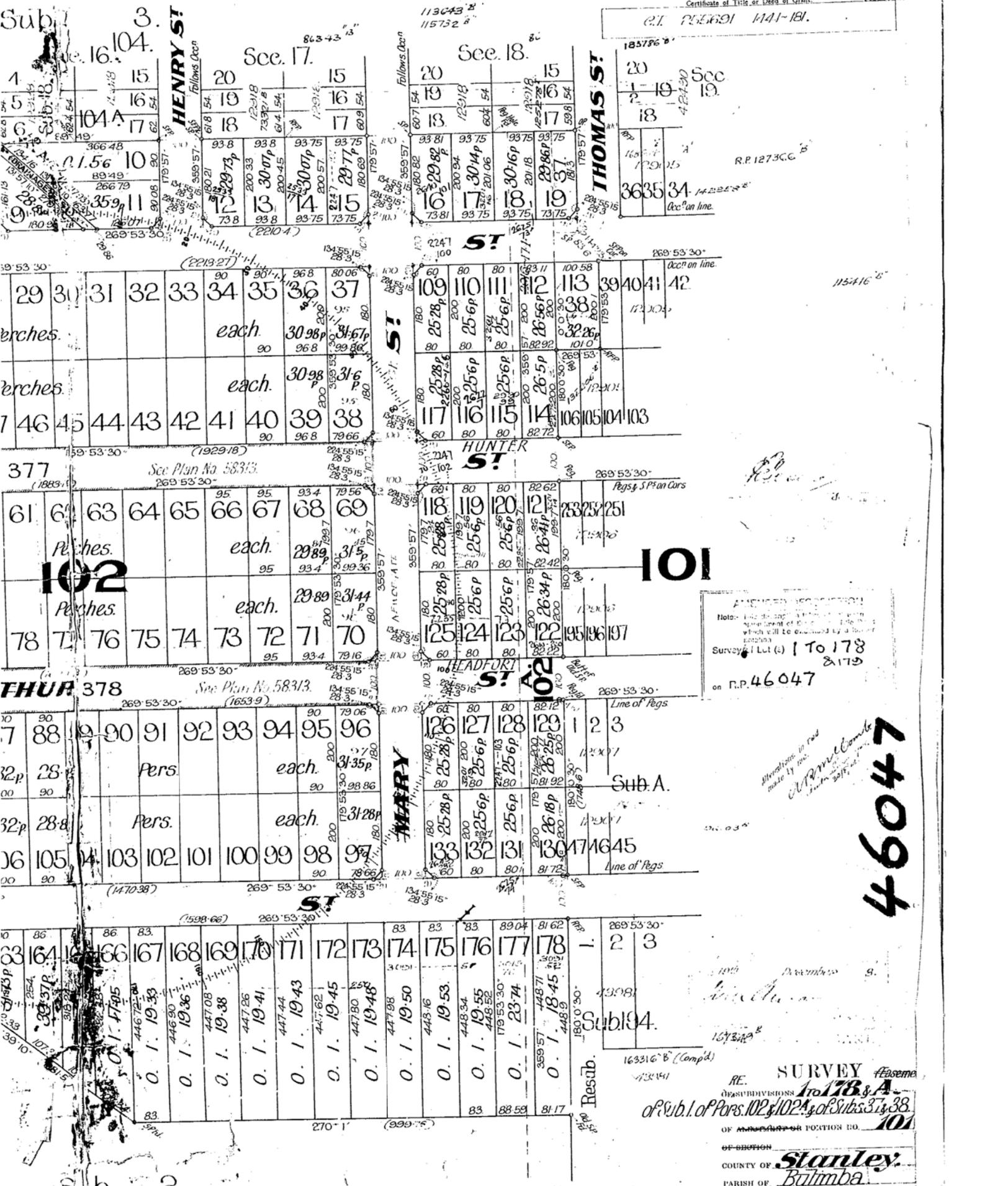
11 JUL 1938

SCALE 1/2" = 100 ft
Proprietor of this land, I agree to the Plan of subdivision, and to the use of the same as shown hereon to public use.

S b.

Certificate of Title or Deed of Grant

21 755691 1441-181.



HENRY ST

THOMAS ST

ST

HUNTER ST

HEADFORD ST

MARY

101

102

102

46047

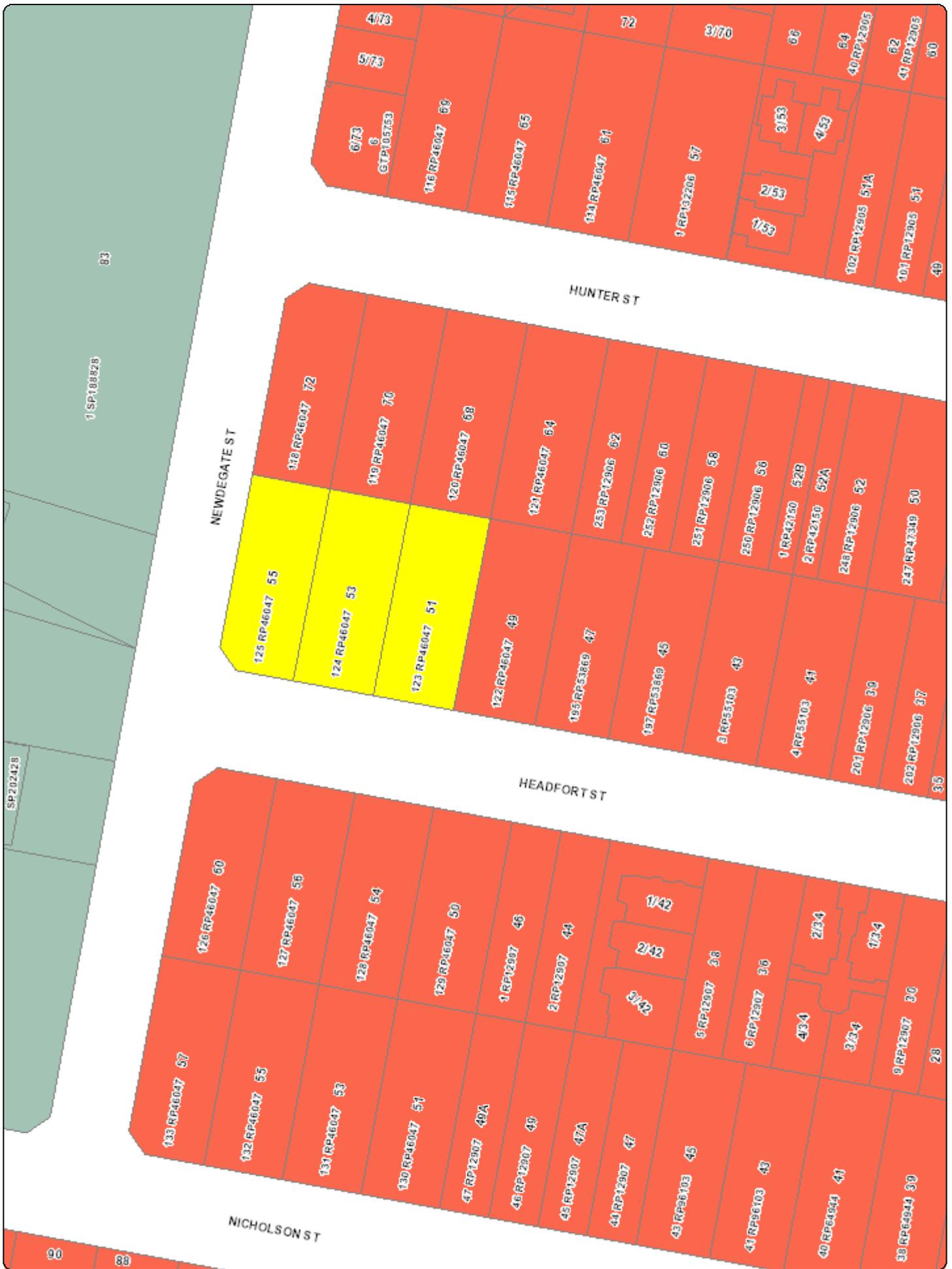
Notes:
 1. This plan is a preliminary plan and is subject to the approval of the Registrar of Deeds.
 2. The area of the land shown on this plan is subject to the approval of the Registrar of Deeds.
 3. The survey is of Lot (s) 1 to 178
 2179
 on R.P. 46047

RE. SURVEY of the
 DIVISIONS 1 to 178 & A
 of Sub. 1 of Pors. 102 & 102A of Sub. 37 & 38
 OF SECTION 101
 COUNTY OF **Stanley**
 PARISH OF **Baltimba**

Appendix D

Brisbane City Council Searches

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



Draft new City Plan



BRISBANE CITY
Planning Scheme

NOTES

This map is notional only and should not be used for interpreting draft new City Plan provisions relating to specific sites. To properly interpret the mapping, the planning scheme must be referred to.

Mapping dated 5 April 2013 in draft new City Plan, not adopted by Council.

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Projection: Map Grid of Australia, Zone 56
Horizontal Datum: Geocentric Datum of Australia 1994

Approximate Scale @ A4 1:1,000



Metres

Legend

---	LGA Boundary	CU2 Community Facilities	SP14 Cottage Industry/Retail
Labels - NAVTEQ_Str...		CU3 Crematorium	SP15 Marina
Street Number		CU4 Education Purposes	SP16 South Bank
Lot and Plan		CU5 Emergency Services	☒ Investigation Area
Parcel		CU6 Health Care Purposes	
Conservation (CN)		CU7 Railway Activities	
Environmental Protection (EP)		CU8 Utility Installation	
Park Land (PK)		EC Emerging Communities	
Rural (RU)		SP1 Major Hospital And Medical Facility	
Sport And Recreation (SR)		SP2 Major Educational And Research Facility	
Low Density Residential (LR)		SP3 Major Defence And Communicati... Facility	
Medium Density Residential (MR)		SP4 Major Sporting Stadium	
High Density Residential (HR)		SP5 Entertainment Centre	
Character Residential (CR)		SP6 Airport	
Low-Medium Density Residential (LMR)		SP7 Port	
General Industry (GI)		SP8 Major Residential Institution	
Future Industry (FI)		SP9 Correctional Centre	
Light Industry (LI)		SP10 The Brisbane Market	
Heavy Industry (HI)		SP11 Vehicle Sales And Service	
Extractive Industry (EI)		SP12 Mixed Industry And Business	
The City Centre (MP1)		SP13 Office Park	
Major Centre (MP2)			
Suburban Centre (MP3)			
Convenience Centre (MP4)			
CU1 Cemetery			

Draft new City Plan

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NOTES

This map is notional only and should not be used for interpreting draft new City Plan provisions relating to specific sites. To properly interpret the mapping, the planning scheme must be referred to.

Mapping dated 5 April 2013 in draft new City Plan, not adopted by Council.

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Projection: Map Grid of Australia, Zone 56
Horizontal Datum: Geocentric Datum of Australia 1994



BRISBANE CITY
Planning Scheme



Dedicated to a better Brisbane

Office of the Chief Executive
Level 23 Brisbane Square
266 George Street Brisbane Qld 4000
GPO Box 1434 Brisbane Qld 4001
T 07 3403 6786 F 07 3334 0043
www.brisbane.qld.gov.au

Our Reference: RTI/IP Appl 2013/14-15
Your Reference:

30 July 2013

Mr Matthew Chenery
Coffey Environments Australia Pty Ltd
Level 2
12 Creek Street
BRISBANE QLD 4000

Dear Mr Chenery

Application for access to documents concerning Lots 123-125 on RP46047 (51, 53 and 55 Headfort Street, Greenslopes)

I refer to your Right to Information application 2013/14-15, received by Council on 17 July 2013, seeking access to information relating to dangerous goods, hazardous material and environmental licences for Lots 123, 124 and 125 on SP46047 at Greenslopes.

Following an investigation of your application, I have been unable to identify any documents specifically relevant to your application.

Accordingly, I, as the Officer directed by this Authority to deal with your application on its behalf pursuant to Section 30 of the *Right to Information Act 2009* (RTI Act), have decided that no documents exist within the scope of your application.

I have, however, identified 6 pages of information pertaining to the site history of these allotments which may be of some use to you and these are enclosed.

As the time taken to process your application did not exceed 5 hours, no processing charges will apply in this instance.

If you are unhappy with my decision, you are entitled to seek an internal review and/or an external review in accordance with the RTI Act. Your application for either internal or external review must be in writing. A copy of the relevant sections from the RTI Act is enclosed for your information, as is a copy of the Office of the Information Commissioner's fact sheet on review rights.

Yours sincerely

David Simons
Right to Information & Information Privacy Officer

Address Common Name Lot Plan Portion Subdivision UPRN VG RIMS Account Name More Searches Help



Applications / Site History

L.123/RP.46047 R.123 S.2 P.102/102A PAR BULIMBA

No Child Properties No Parent Properties

Official Location 51 HEADFORT ST GREENSLOPES QLD 4120

DART APPLICATIONS

Application Ref	Application Type	Shop/Unit	Recd Date	Status Date	Status	Old Appln No	Purpose
<u>A001531660</u>	Prelodgement (DA)		23-DEC-2004	07-MAR-2005	Refused	910888:DA	
<u>A000944813</u>	Request for Assessment by DRS		22-JUN-2005		Current	1305775:BLDG Application	
<u>A000107023</u>	Scrutiny Compliance Permit, Commercial		01-JAN-1999	22-MAR-1995	Current	453712:PLBG	
	Compliance Certificate, Commercial		01-JAN-1999	21-NOV-1995	Current	453712:PLBG	
<u>A000107022</u>	New Approval, Domestic		01-JAN-1999		Assessment	453711:PLBG	
<u>A000107021</u>	New Approval, Domestic		01-JAN-1999	01-JAN-1999	Current	453710:PLBG	
	Compliance Certificate, Domestic		01-JAN-1999	20-JAN-1997	Current	453710:PLBG	

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Address Common Name Lot Plan Portion Subdivision UPRN VG RIMS Account Name More Searches Help



Applications / Site History

L.124/RP.46047 R.124 S.2 P.102/102A PAR BULIMBA

No Child Properties No Parent Properties

Official Location 53 HEADFORT ST GREENSLOPES QLD 4120

DART APPLICATIONS

Application Ref	Application Type	Shop/Unit Recd Date	Status Date	Status	Old Appln No	Purpose
<u>A001531660</u>	Prelodgement (DA)	23-DEC-2004	07-MAR-2005	Refused	910888:DA	
<u>A000107023</u>	Scrutiny Compliance Permit, Commercial	01-JAN-1999	22-MAR-1995	Current	453712:PLBG	
	Compliance Certificate, Commercial	01-JAN-1999	21-NOV-1995	Current	453712:PLBG	
<u>A000107022</u>	New Approval, Domestic	01-JAN-1999		Assessment	453711:PLBG	
<u>A000107021</u>	New Approval, Domestic	01-JAN-1999	01-JAN-1999	Current	453710:PLBG	
	Compliance Certificate, Domestic	01-JAN-1999	20-JAN-1997	Current	453710:PLBG	

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Applications / Site History

L.125/RP.46047 R.125 S.2 P.102/102A PAR BULIMBA

No Child Properties No Parent Properties

Official Location 55 HEADFORT ST GREENSLOPES QLD 4120
Alternate Address 112 NEWDEGATE ST GREENSLOPES QLD 4120

DART APPLICATIONS

Application Ref	Application Type	Shop/Unit	Recd Date	Status Date	Status	Old Appln No	Purpose
<u>A001531660</u>	Prelodgement (DA)		23-DEC-2004	07-MAR-2005	Refused	910888:DA	
<u>A000945422</u>	Request for Assessment by DRS		29-JUN-2005		Current	1306487:BLDG Application	
<u>A000944813</u>	Request for Assessment by DRS		22-JUN-2005		Current	1305775:BLDG Application	
<u>A000107023</u>	Scrutiny Compliance Permit, Commercial		01-JAN-1999	22-MAR-1995	Current	453712:PLBG	
	Compliance Certificate, Commercial		01-JAN-1999	21-NOV-1995	Current	453712:PLBG	
<u>A000107022</u>	New Approval, Domestic		01-JAN-1999		Assessment	453711:PLBG	
<u>A000107021</u>	New Approval, Domestic		01-JAN-1999	01-JAN-1999	Current	453710:PLBG	
	Compliance Certificate, Domestic		01-JAN-1999	20-JAN-1997	Current	453710:PLBG	

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Location Details

Location Name: 51 HEADFORT ST GREENSLOPES
QLD 4120 (RP46047/L123
RP46047/L125)
Location Type: DART Lot Configuration
Status: Active
Water Body:
Owner Name: Red Cross Society

Address

Shop/Flat/Unit No.:
House No - Suffix: 51
Street(Name Type Ext): HEADFORT Street
Suburb: GREENSLOPES
State: QLD P/Code: 4120
N Contaminated Land
N Sensitive Location

Description

Frontages

Address

112 NEWDEGATE ST GREENSLOPES QLD 4120
51 HEADFORT ST GREENSLOPES QLD 4120
55 HEADFORT ST GREENSLOPES QLD 4120
55 HEADFORT ST GREENSLOPES QLD 4120

Address Usage

Wide Frontage
Postal
Narrow Frontage
Postal

Lot Plan

Lot	Plan Type	Plan	Parish
123	Registered Plan	46047	RP46047/L123
125	Registered Plan	46047	RP46047/L125

Coordinates

Coordinate Type	Easting/Latitude	Northing/Longitude
-----------------	------------------	--------------------

Application

Project Ref	Project Name	Application Date	Decision Level
1305775:BLDG	CONVERSION/REQUEST FOR ASSESSMENT BY DRS/BIDS Ref: 1305775	22-JUN-2005	

Permit Activity

Lot Plan	Permit Type	Permit Status	Permit Ref	Effective Date
L123/RP46047	Request for Assessment by DRS	Current	BD10087550407	
L125/RP46047	Request for Assessment by DRS	Current	BD10087550407	

Compliance Action

Ref	Date	Status	Type	Project Manager	Con
-----	------	--------	------	-----------------	-----



Location Details

Location Name: 55 HEADFORT ST GREENSLOPES
QLD 4120
Location Type: Holding
Status: Active
Water Body:
Owner Name: Australian Red Cross Society

Address
Shop/Flat/Unit No.:
House No - Suffix: 55
Street(Name Type Ext): HEADFORT Street
Suburb: GREENSLOPES
State: QLD P/Code: 4120
N Contaminated Land
N Sensitive Location

Description

Frontages

Address

112 NEWDEGATE ST GREENSLOPES QLD 4120
114 NEWDEGATE ST GREENSLOPES QLD 4120
51 HEADFORT ST GREENSLOPES QLD 4120
53 HEADFORT ST GREENSLOPES QLD 4120
55 HEADFORT ST GREENSLOPES QLD 4120

Address Usage

Wide Frontage
Narrow Frontage
Postal
Postal
Narrow Frontage
Postal
Valuation
Wide Frontage

Lot Plan

Lot	Plan Type	Plan	Parish
123	Registered Plan	46047	RP46047/L123
124	Registered Plan	46047	RP46047/L124
125	Registered Plan	46047	RP46047/L125

Coordinates

Coordinate Type	Easting/Latitude	Northing/Longitude
-----------------	------------------	--------------------

Application

Project Ref	Project Name	Application Date	Decision Level
453710:PLBG	CONVERSION/SEWERAGE NETWORK HOUSE CONNECT/BIDS Ref: 453710/OLD Ref: 293000000	01-JAN-1999	
453711:PLBG	CONVERSION/SEWERAGE NETWORK HOUSE CONNECT/BIDS Ref: 453711/OLD Ref: 293000000	01-JAN-1999	
453712:PLBG	CONVERSION/SEWERAGE NETWORK HOUSE CONNECT/BIDS Ref: 453712/OLD Ref: 293000000	01-JAN-1999	
910888:DA	CONVERSION/PRELODGE/MENT/BIDS Ref: 910888	23-DEC-2004	

Permit Activity

Lot Plan	Permit Type	Permit Status	Permit Ref	Effective Date
L123/RP46047	Compliance Certificate, Commercial	Current	CP06015921205	21-NOV-1995
L123/RP46047	Compliance Certificate, Domestic	Current	DP04015920905	20-JAN-1997
L123/RP46047	New Approval, Domestic	Assessment	DP01015921005	
L123/RP46047	New Approval, Domestic	Current	DP01015920805	01-JAN-1999
L123/RP46047	Prelodgement (DA)	Refused	PL01155633507	07-MAR-2005
L123/RP46047	Scrutiny Compliance Permit, Commercial	Current	CP01015921105	22-MAR-1995
L124/RP46047	Compliance Certificate, Commercial	Current	CP06015921205	21-NOV-1995
L124/RP46047	Compliance Certificate, Domestic	Current	DP04015920905	20-JAN-1997
L124/RP46047	New Approval, Domestic	Assessment	DP01015921005	
L124/RP46047	New Approval, Domestic	Current	DP01015920805	01-JAN-1999
L124/RP46047	Prelodgement (DA)	Refused	PL01155633507	07-MAR-2005
L124/RP46047	Scrutiny Compliance Permit, Commercial	Current	CP01015921105	22-MAR-1995
L125/RP46047	Compliance Certificate, Commercial	Current	CP06015921205	21-NOV-1995
L125/RP46047	Compliance Certificate, Domestic	Current	DP04015920905	20-JAN-1997
L125/RP46047	New Approval, Domestic	Assessment	DP01015921005	



Location Details

Lot Plan	Permit Type	Permit Status	Permit Ref	
L125/RP46047	New Approval, Domestic	Current	DP01015920805	01-JAN-1999
L125/RP46047	Prelodgement (DA)	Refused	PL01155633507	07-MAR-2005
L125/RP46047	Scrutiny Compliance Permit, Commercial	Current	CP01015921105	22-MAR-1995

Compliance Action

Ref	Date	Status	Type	Project Manager	Con
C1195168	25-AUG-2011	Finalised	Illegal Parking		N
C734404	15-OCT-2009	Finalised	Illegal Parking	MARCZYK, Ben	N
C480851	12-AUG-2008	Finalised	Illegal Activities	HERBERT, Noel	N
C211466	24-APR-2007	Finalised	Illegal Parking	KIRKHAM, Trevor	N
INV51873	30-OCT-2006	Closed	Legislation Audit	KINGSFORD, Robert	N

Appendix E

Registered Groundwater Bore Search

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

DATE 16/07/2013

BORE CARD REPORT - PUBLISHABLE

REG NUMBER 133887

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1430	LATITUDE 27-30-47	MAP-SCALE
DATE LOG RECD 10-JUL-06	SUB-AREA	LONGITUDE 153-03-28	MAP-SERIES
D/O FILE NO.	SHIRE 1000-BRISBANE C.	EASTING 505697	MAP-NO
R/O FILE NO.	LOT 127	NORTHING 6956722	MAP NAME
H/O FILE NO.	PLAN RP13250	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.513177	PARISH NAME 758-BULIMBA		ORIGINAL BORE NO
GIS LNG 153.0576848	COUNTY STANLEY		BORE LINE -
CHECKED Y	PROPERTY NAME		POLYGON
	FIELD LOCATION		RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 11/04/2006		DATA OWNER
STATUS AD	DRILLERS NAME DIPPEL, KENNETH ALLAN		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY K.A. & L.C. DIPPEL		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	11/04/2006	1	Cuttings or other fill betw een casing and h				5.00	65.50
A	11/04/2006	2	Grout			230	0.00	1.00
A	11/04/2006	3	Grout			190	1.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	0.30	TOPSOIL
2	0.30	1.10	CLAY YELLOW
3	1.10	2.40	ROCK PINKISH POWDERY
4	2.40	3.00	YELLOW SCHIST POWDERY
5	3.00	3.40	PINK POWDERY ROCK
6	3.40	24.40	ROCK YELLOW & BROWN & GREY POWDERY

DATE 16/07/2013

BORE CARD REPORT - PUBLISHABLE

REG NUMBER 133887

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
7	24.40	26.80	GREY SANDSTONE
8	26.80	27.40	FRACTURED GREY SANDSTONE
9	27.40	39.60	GREY SANDSTONE
10	39.60	51.20	GREY SHALE & SANDSTONE
11	51.20	52.40	SOFTER GREY SHALE WET
12	52.40	57.90	GREY SANDSTONE & SHALE
13	57.90	65.50	BLACK SOFTER SHALE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD (l/s)	CTR	CONDIT	FORMATION NAME
1	51.20		SHLE				SALTY	0.03	Y	UC	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

DATE 16/07/2013

REG NUMBER 133887

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

PIPE	DATE	REC	NOTES
A	11/04/2006	1	Backfilled Insufficient Water Salty

DATE 16/07/2013

BORE CARD REPORT - PUBLISHABLE

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**** End of Report ****



**Queensland
Government**

Groundwater Database

Data Dictionary & Standards

Revision Date: 13/12/2011
Version 7

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GWDB STRUCTURE AND CONCEPTS

INTRODUCTION

The following information is provided to explain the structure of the database and the terminology used in this manual.

Database

A Database is a quantity of data organised in a planned manner. A Database Management System is a collection of programs that help you organise and use your information in a planned way.

Data means information, like names and addresses, allocations, property descriptions, etc.

A comprehensive summary of the management and technical details of the bores are stored in specially designed "subject" tables.

Columns

One piece of information is placed in a column e.g. Registered Number (RN). A column is made up of one or more characters e.g. alphabetic, numeric, brackets, etc.

Rows

One or more columns make up a row e.g. a *Strata Log* row in the Groundwater Database is composed of the following columns

- Registered Number
- Record
- Top of Strata
- Bottom of Strata
- Description

Table

A number of rows with the same column structure make up a table e.g. a number of Water Level rows.

The Groundwater Database is a Relational Database, consisting of a series of tables related to each other, by means of the registered number of the bore. For a list of the data tables and their structure found in the Groundwater database refer to **Appendix 1**.

Identification Data

The information required to identify a row in a table varies from one table to another.

The most common Identification Data for records in the Database are:

- Registered Number**
- Pipe**
- Date**
- Record**

A full description of each item follows.

Registered Number

Every facility for which it is required to record data in the Groundwater Database must be given a **Registered Number**. Its purpose is to uniquely identify the facility. The facility could be a production bore, a test bore, a surface water facility or anything about which it is desirable to record data in a format acceptable to the Database.

The **Registered Number** is the identifier common to all tables. It allows the rows in different tables for a particular facility to be linked together.

It must be present for every record in the Database. The Registered Numbers must be unique and will be issued in blocks from the System Administrator. These blocks will be issued to Districts on request.

Registered Numbers can be used to identify private bores which do not require licensing but have information that the office requires to be stored. The identification data available in the **Registration table** should be sufficient to identify these bores.

The convention of allocating eight and nine digit numbers to Dept. of Environment & Resource Management (DERM) investigation bores is to continue. It is each District's responsibility to ensure precise issue of these numbers to avoid duplicates. Districts must liaise if there is a need to identify bores in shared basins.

RN Block Issue

The following list shows the current Registered Number block for each office (08/12/2011).

OFFICE	BLOCK IN USE
Ayr	153000-153999
Biloela	128000-128999
Brisbane	152000-152999
Bundaberg	156000-156999
Charleville	116000-116999
CSG bores	160000-160999
Emerald	132000-132999
Gatton	154000-154999
Goondiwindi	77000-77999
Longreach	146000-146999
Mackay	141000-141999
Mareeba	148000-148999
Mundubbera	155000-155999
Oil Bores	100000-101999
Rockhampton	151000-151999
Roma	123000-123999
St. George	49000-49999
Toowoomba	147000-147999
Warwick	149000-149999

Shared Basins

For your information the list below shows drainage sub-basins, which have records in the Database for more than one district:

0012	1200	1301	1361	4162	4224	9151
0031	1201	1302	1362	4163	4225	9152
0032	1202	1303	1363	4164	4232	9160
0033	1203	1304	1410	4172	9121	
0112	1220	1305	1430	4222	9130	
1160	1300	1360	1432	4223	9150	

Pipes

Single pipe

A single pipe refers to one that operates as if it has a single length of casing. However, by definition in the Groundwater Database, a bore with several different diameter casings joined concentrically to effectively form a single pipe will be called a single pipe bore.

For the single bore, single pipe condition, the **Pipe** field, if it exists in the identification data, must be filled in with an **A**.

Multiple Pipes

A multiple pipe bore is one with a number of single pipes in a hole. Each **Pipe** is separated from the others in such a way that each one acts as if it was a single pipe bore. A multiple pipe bore is given the one **Registered Number** and each pipe identified as A, B, C etc. with A being the deepest, B the second deepest and so on.

In a multiple hole situation where there is more than one hole containing pipes (e.g. nested spears) with the same **Registered Number**, the **Pipe** identification A, B, C etc must be extended across all holes. The **Pipe** identification must follow the depth convention.

No Pipe

If data refers to a borehole before it is completed with a pipe, the **Pipe** field must be filled in with **X**. An example would be a conductivity measurement taken during drilling.

For the **Casing Table** the pipe field must be filled in with **X** for records about material not directly related to a **Pipe**. For example grout, steel protector etc.

If a surface water facility is to be recorded in a table that has **Pipe** in the identification data, the field must be completed with **X**.

Date

For many of the tables it is important to distinguish between data recorded at different times for the same facility. This is done by using the date on which the particular action took place.

If the **day** in the date cannot be ascertained the first day of the month may be adopted.

If the **month** cannot be ascertained January may be adopted.

If the **year** cannot be found the year 2100 may be adopted.

The date is necessary for most of the data, e.g. water level monitoring, water analysis, etc. and the entry of an adopted date makes the data of little use.

The adopted date of 01/01/2100 should be used sparingly and only after an exhaustive search has been made for the correct date.

Record

The **Record** is a number between 1 and 999 inclusive, depending on the table. It is the next highest level of unique identification, after date.

Records in examples 1 and 2 (below) can be the same because they are distinguished by date.

Records in examples 2 and 3 (below) must be different because they are on the same date.

	<u>RN</u>	<u>Date</u>	<u>Record No.</u>
Example 1	100	01/01/1980	1
Example 2	100	02/01/1980	1
Example 3	100	02/01/1980	2

Non Optional Fields

These are fields considered essential to the record and **cannot be left blank**. The screen will respond with *Value Entry Required* if no entry is made. You will also notice that the non-optional fields names are displayed in red. **Note:** The Registered Number is compulsory for all tables in the database.

An example of the **non-optional** fields in the major tables are shown below:

Registration Table

RN
Office
Parish
Shire Code
Facility Type

Strata Log Table

Rec
Description

Stratigraphy

Source
Rec
Description

Casing

Pipe
Rdate
Rec

Elevation Table

Pipe
Rdate
Elevation
Measurement Point
Datum
Precision

Water Level Table

Pipe
Rdate
Measurement
Measurement Point

Water Analysis Table

Pipe
Rdate
Rec
Analyst
Analysis Number

Multiple Conductivity

Pipe
Rdate
Depth
Conductivity

Field Water Quality

Pipe
Rdate

Aquifer

Rec
From
Condition
Lithology – Seq & Code

DESCRIPTION OF DATA TABLES

GENERAL INFORMATION

These are tables that hold data that relate to the groundwater resource and its management. The main data tables are:

- Registration Table**
- Casing Table**
- Strata Log Table**
- Aquifer Table**
- Elevation Table**
- Water Level Table**
- Water Quality Field Measurement Table**
- Water Analysis Table**
- Special Water Analysis Table**
- Multiple Conductivity Table**
- Stratigraphy Table**

If data is to be stored in other tables within the database then all facilities must have an entry in the **Registration Table**.

As identification data occur in all tables, they are described and explained only once in the preceding section GWDB Structure and Concepts.

REGISTRATION TABLE

INTRODUCTION

A record must be made in the **Registration Table** if information is to be stored in any other table. The information recorded in this table is vital for locating the facility geographically, and recording its type and status.

Oracle Table Name: **gw_regdets**

Column Names

Registered Number	Office
Data Owner	District Office File Number
Regional Office File Number	Head Office File Number
Lot	Registered Plan (RP)
Original Description	Parish
Shire	County
Property Name	Field Location
Facility Type	Facility Status
Facility Role	Latitude
Longitude	Easting
Northing	Zone
Accuracy	GPS Accuracy
Map Scale	Map Series
Map Number	Progress Section
Basin	Sub Area
Polygon	Date Drilled
Driller Name	Drilling Company
Method of Construction	Original Facility Number or Name
RN of Bore Replaced	Bore Line
Present Equipment	Confidential
Checked	GIS Latitude
GIS Longitude	Log received date

Office

The office bore data is administered by each regional office. This field is a compulsory field in the database.

Valid office codes are:

AYR	Ayr
BIL	Biloela
BNE	Brisbane
BBG	Bundaberg
CHV	Charleville
EMD	Emerald
GTN	Gatton
GDI	Goondiwindi
LGH	Longreach
MKY	Mackay
MBA	Mareeba
MDB	Mundubbera
RCK	Rockhampton
RMA	Roma
STG	St. George
TBA	Toowoomba
WCK	Warwick

Log Received Date

This field records the date the drillers log has been received by the departmental office. The format for the date must be DD/MM/YYYY (eg. 04/03/2005). You can enter the date manually or by clicking in the field a little box with three dots will appear. By clicking on this you can invoke a calendar and choose the date from this. The Log Received Date cannot be less than the drilled date.

Data Owner

The data owner is the organisation that owns all of the data that relates to the bore and is usually responsible for the collection of that data. Only data belonging to DERM should be released to the public. Valid data owners are:

DNR	Department of Natural Resources (now DERM)
DME	Department of Minerals and Energy
AGS	Australian Geological Survey Organisation
BHP	BHP Pty Ltd
LCC	Lockyer Catchment Centre
SUN	Sunwater
MDS	Old Murray Darling Dryland Salinity
NAP	National Action Plan
PFI	Prawn Farm Investments

File Number

All correspondence regarding the facility should be stored on file and the file number entered into the GWDB for reference.

District Office File Number

The identification of the District Office paper file in which details about the facility are contained is entered here. It is a field twelve (12) characters long. If this field is to be used to identify all the facilities on the one file, the **file number** must be written the same way each time it is entered in the field. For example the following **file numbers** would not be grouped together if a search were made for all the facilities on the file. The blank between the "W" and the "2" in the second example would make it different from the first.

Example 1 W231/2
Example 2 W 231/2

Regional Office File Number

The identification of the Regional Office paper file in which details about the facility are contained is entered here. It is a field twelve (12) characters long. If this field is to be used to identify all the facilities on the one file, the **file number** must be written the same way each time it is entered in the field. For example the following **file numbers** would not be grouped together if a search were made for all the facilities on the file. The blank between the "W" and the "2" in the second example would make it different from the first.

Example 1 W231/2
Example 2 W 231/2

Head Office File Number

The **Head Office File Number** referring to the facility should be stored here. It is a field up to seven characters long. It should be written in by the District Office if it is known. If this field is to be used to find all the facilities on the same file the file number must be written the same way each time it is entered.

For example the following **file numbers** would not be grouped together if a search were made for all the facilities on the file. The blank between the "W" and the "2" in the second example would make it different from the first.

Example 1 W231/2
Example 2 W 231/2

Lot

The **Lot** is the number of the lot on a **Registered Plan** on which the facility is located.

Registered Plan

The Plan or **Registered Plan** is the number of the Plan that contains the **lot** on which the facility is located.

Description

This field is for the Real Property Description of the land on which the facility is located, other than a lot and Registered Plan number which is provided for separately. If a Lot and Registered Plan have been entered in their designated fields, this field may be used to record the original portion number.

The **Parish** and **County** are allowed for in the following two fields. It should be noted that it is **not** a property description of all the land owned, it simply describes the land on which the facility is located.

Because the real property descriptions can be long the abbreviations given at the end of this description are to be used. The abbreviations follow the standard set used by the **Division of Valuation of the Lands Department**, as at December 1990. Refer to **Appendix 2** for plan abbreviations.

EXAMPLES

S1-2 A20 -SSEC45	SL 43/7634
A18-19	L1-2 ME14589 SL 43/7629
S1 R1 S2 P139	L1-2 MT14647 PO 87/4484
R24-33 S3 P139	RESERVE 123

L1-2 WD14547	STRATA
L1-3,6 RP12345	

Parish

The **Parish** is required in conjunction with the **Description** and **County** fields to define the location of a facility. It is necessary to code **Parish** because there is a number of Parishes in Queensland with the same name. Use the publication listed below to find the correct parish number. This field is a compulsory field in the database.

Edition Three
"Queensland Parish Directory"
Authorised by K J DAVIES
Surveyor General
Queensland July, 1986

Parish codes are decoded using entries in the **Parish Names Table**, which stores both codes and corresponding names.

Shire

A **Shire** represents an area of Local Government in Queensland. Each **Shire** is named and given a Number on **Page 96** in the following publication. This field is a compulsory field in the database.

Edition Three
"Queensland Parish Directory"
Authorised by K J DAVIES
Surveyor General
July 1986

This Directory should be available in each District Office.

County

The **County** is required in conjunction with **Description** and **Parish** to define the location of a facility. The **County** will be recorded by name and not coded because County names are unique. It is thus important that the name is written the same way each time to allow grouping of data. If the name consists of two words it is essential to have the same number of blanks between the two each time. e.g. DEAS THOMPSON must always have one blank between the S and T. If two blanks are used the values will be taken as different when grouping data. Use ONE space as the separator between words in a name. Another example would be O'CONNEL. If the apostrophe is included in one instance and not included in another they will be treated differently.

Property Name

This is a **30**-character field used to store the name of the property on which the bore is situated. It can prove useful in finding all bores located on the one property.

Field Location

The field location is used to help locate the bore in the field. It may be the residential address of the land on which the bore is located, or identify a landmark that the bore is near.

Eg. 82 Rose Street, Bundaberg
Eg. On Highway, 50m north of St Mary's Church, Canungra.

Facility Type

This field is required to describe the type of facility about which we are recording data. The break-up is relatively simple in that the basic distinction is between surface water and groundwater facilities. A further break-up of the groundwater facilities is whether they are artesian in various conditions or sub-artesian. This field is a compulsory field in the database.

DESCRIPTION	CODE
Sub-artesian Facility	SF
Artesian Bore, Condition Unknown	AB
Artesian Bore, Controlled Flow	AF
Artesian Bore, Uncontrolled Flow	AU
Artesian Bore, Ceased to Flow	AC
Artesian Bore, Seasonal Flow	AS
Surface Water Facility	SW

Facility Status

The **Facility Status** defines whether the facility is proposed, existing, abandoned and destroyed or abandoned but still useable. This field is a compulsory field in the database. The **proposed** status would refer mainly to private facilities that have not been constructed. The **existing** status is important for both private and Commission facilities. The statistics for existing (not abandoned) Commission observation points are also required. The two states of abandonment shown in the codes are mainly required for observation facilities that are not in use but could be re-activated easily.

Private facilities that are constructed but not equipped are recorded as existing, if the intention is to use the facility in the future. The **Present Equipment** entry will show if it is not equipped. If the facility is useable but temporarily abandoned such as a stand-by bore or a replacement bore the **Facility Status** should be recorded as abandoned but useable i.e. code **AU**. If it has been destroyed it is coded **AD**, abandoned and destroyed.

It is important that this field be completed. It is particularly important for licensed bores as the field is used along with the **Facility Type** field and other fields in determining which licence conditions are automatically assigned to a bore.

DESCRIPTION	CODE
Proposed	PR
Existing	EX
Abandoned and Destroyed	AD
Abandoned but still useable	AU

Facility Role

The facility role is stored in a separate table in the database, but appears on the registration screen. The user can enter as many valid facility roles as necessary. Comments about the facility role can also be stored. For example when the role began and ended.

ROLE	CODE
Water Supply	WS
Water Resources Investigation	IN
Sub-Artesian Monitoring	SM
Great Artesian Basin Monitoring	GM
Nodal Point for Model	NP
Petroleum or Gas Exploration	PE
Mineral or Coal Exploration	ME
Other Exploration/Investigation	OE
Stratigraphic Investigation	SI

Latitude

Latitude and Longitude are used to describe the position of the facility on the earth's surface. Enter as degrees, minutes and seconds eg.24-30-24. Fractions of a second are not allowed. All latitudes are stored as South by default. Latitudes south of the equator are commonly reported as negative. This is not required in the Groundwater Database. All Latitudes in the GDWB are GDA94. Upon entry of a latitude the facility status is checked to see if the bore is proposed. If the bore is proposed a warning is displayed prompting users to change the facility status to existing.

Longitude

Latitude and **Longitude** are used to describe the position of the facility on the earth's surface. Enter as degrees, minutes and seconds eg.152-30-23. Fractions of a second are not allowed. All longitudes are stored as East by default. All Longitudes in the GDWB are GDA94

Easting

The **Easting** is required to define the Map Grid of Australia (**MGA**) co-ordinates. The easting must be a 6-digit number. Upon entry of an easting the facility status is checked to see if the bore is proposed. If the bore is proposed a warning is displayed prompting users to change the facility status to existing.

Northing

The **Northing** is required to define the Map Grid of Australia (**MGA**) co-ordinates. The northing must be a 7-digit number.

Zone Number

The **Zone Number** is required to define the Map Grid of Australia (**MGA**) co-ordinates. The zone must be a 2-digit number and be between zone 53 and zone 56.

Accuracy

This field records how accurately the facility has been located. There are six accuracy codes.

ACCURACY	CODE
Survey	SURV
Sketch	SKET
Aerial Photo	PHOT
Government Inspection	INSP
Unknown	UNKN
Global Positioning System	GPS

Survey

The location of the facility has been determined by a proper survey.

Sketch

The property owner or driller or other person has provided a sketch or plan of the property with the bore location indicated on it.

Photo

The bore has been located by using aerial photographs.

Inspection

The bore has been inspected by a Government Officer, and approximately located using methods such as car mileage etc

Unknown

It is unknown how the bore's position has been determined.

Global Positioning System

The bores location has been determined by a global positioning system (GPS).

GPS Accuracy

The accuracy of the global positioning system.

Eg. 100 means a GPS with an accuracy of ± 100 metres has been used.

Map Scale

A map or plan on which the facility is plotted for location purposes will be identified using the three fields **Map Scale**, **Map Series** and **Map Number**. Each field is treated separately.

The **Map Scale** code is a three digit number defined in such a way that it will tell you what the actual scale is.

Consider the following examples:

1. 1:2 500 Scale

The first two digits of the 2 500 are recorded as the first and second digit of the 3 digit number. The number of trailing zeros after the first two digits is then recorded. i.e. 2 for the above scale.

Thus the code for 1:2 500 is 252.

2. 1:100 000 Scale

The first two digits are 10 and there are four trailing zeros therefore the code will be 104

For the old **Imperial** type maps that were used to record groundwater details the approach is simply to use 4ML for four mile, 20C for twenty chain etc. Refer to the map scales and codes.

Map Scale Codes

DESCRIPTION	CODE
1:2 500	252
1:5 000	502
1:10 000	103
1:25 000	253
1:50 000	503
1:100 000	104
1:250 000	254
4 Mile Series	4ML
2 Mile Series	2ML
40 Chain	40C
20 Chain	20C

Map Series

Use this field to record which of the following series the map used to locate the bore belongs.

MAP SERIES	CODE
New Series	N
Metric Series	M
Department Plans	C

New Series

These are all the **Imperial** bore location maps still in use i.e. 4 mile, 2 mile, 40 chain and 20 chain with the exception of Department plans. The words "NEW SERIES" may or may not appear on the map.

In time these maps will be phased out as metric maps become available.

Metric Series

These are all metric scale maps produced on the National Mapping System.

Department Plans

These are special maps produced by the Department where existing mapping is not satisfactory for our purposes.

As they do not conform to the National Mapping System they carry Department plan numbers.

Map Number

This is a character field, i.e. accepts both alphabetic and numeric characters. All maps have or should have a unique identifying formatting of the numbers in this field as required for subsequent retrieval and grouping of all the bores on a map or plan.

Some maps also have names. These names must not be entered in this field.

New Series Numbers

For 4 mile maps these will be 2 digits only.

For 2 mile maps these will be 3 digits only.

For 40 chain maps these will be 4 digits only.

For 20 chain maps these will be 4 digits followed by the letter A, B, C or D (no spaces, no dashes).

The number may or may not be repeated in the title block (where the Commission plan number usually appears) in the format e.g. 20-4296A. In this case the number required is 4296A. Actual map number must take precedence over Commission plan number if both are shown on a plan.

Metric Series Numbers

The smallest scale maps are **1:250 000** and these numbers are 2 letters, 2 digits, a dash and digits 1 to 16 e.g. SP54-8 or SP54-12.

All other maps are divisions of the **1:100 000** map, which are 4 digits only.

The **1:50 000** maps are 4 digits, a dash and a number 1, 2, 3 or 4 where the 4 digit number is the **1:100 000** sheet and the numbers 1 to 4 are NE, SE, SW and NW quarters respectively. Thus a **1:50 000** number looks like 5286-2.

1:25 000 maps are an extension of the same quartering system. Thus a **1:25 000** number looks like 5286-23.

1:10 000 maps are the next breakdown and would look like 5286-231 and so forth down to the largest scale produced.

Progress Section

This field stores the Plan Number of the Progress Section on which DERM Investigation bores have been located.

Basin

The **Basin** is a four-digit number that is consistent with those numbers used by the Department to define the surface water drainage sub-basins in Queensland. For definition of these drainage sub-basins you should refer to the Department's WRC plans, V38883 to V38900, or to Water Resources basin maps.

Sub-Area

The **Sub-Area** is a three-digit number that allows each District to sub-divide its area into a maximum of 999 areas. These additional 999 areas need not correspond to surface water drainage or any other geographical feature and can be used to define irrigation areas, licensing areas, bores accessing a particular aquifer, etc.

Polygon

The Polygon field is used to record the polygon number or code in which the bore is located, for Groundwater Modeling purposes.

Date Drilled

The **Date Drilled** is the date on which the drilling of the bore was completed. It stores the initial completion date and not the date of subsequent deepening's. The drilled date must not be greater than the Log Received Date.

Driller Licence

This field records the licence number and name of the Driller who drilled the initial bore at the site. The standard format for entering a drillers name is Lastname, Firstname Secondname (eg. Bloggs, Jo Peter).

Drilling Company

The drilling company is the name of the company who drilled the initial bore at the site.

Method of Construction

The method used to construct the facility is recorded in this column. e.g. CABLE TOOL, ROTARY, PICK AND SHOVEL.

Original Facility Number or Name

The main use of this column will be to identify facilities using the local bore name where possible.

The entry of original site numbers for investigation bores provides useful cross-referencing.

RN of Bore Replaced

The RN of Bore Replaced field is used to record the Registered Number of the facility that this new facility has replaced.

Bore Line

In many investigation areas, bores were drilled in lines and identified with local names. Occasionally private bores were included in the lines. Plans and bore sections exist showing the location of these bores and the identity of the **Bore Lines**.

Each Bore Line was given a name which was not necessarily unique and consequently each Bore Line has been given a unique three-letter code.

Present Equipment

This coded field is to describe the equipment on a facility. Generally it applies to the type of pump.

Allowance has also been made for automatic recorders on observation bores. A code is available for staff gauges used to record surface water levels in groundwater investigations.

DESCRIPTION	CODE
Windmill and Cylinder Pump	WL
Windmill and Cylinder Pump, additional power	WA
Cylinder Pump, additional power	CA
Centrifugal Pump	CL
Jet or Pressure Pump	JP
Turbine	TE
Helical Screw	HS
Submersible	SP
Other Pump	OR
No equipment/headworks	NE
Automatic Recorder	AR
Staff Gauge or bridge, culvert, ford, etc.	SG
Headworks (Artesian Bores)	HW
Orifice Plate	OP

Confidential

A bore which contains details that must not be released to the public, must be flagged as confidential. Any details on unlicensed bores which have been collected by PWF surveys, or Groundwater Advisory jobs, or obtained from mining companies (not on open file) fall into the category of confidential.

Checked

This field indicates whether or not the location of the bore has been validated by the Bore Location System. The field can only be updated by the Bore Location System.

GIS Latitude

Latitude in decimal degrees derived from the **bore location system**. It is the location with respect to the boundaries stored in the Departmental Digital Cadastral Database (DCDB). This data can only be updated through the bore location system.

GIS Longitude

Longitude in decimal degrees derived from the **bore location system**. It is the location with respect to the boundaries stored in the Departmental Digital Cadastral Database (DCDB). This data can only be updated through the bore location system.

CASING TABLE

INTRODUCTION

This table records the facility's casing details. A number of records can be entered to describe the history of the facility's casing. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_casings**

Column Names

Registered Number
Pipe
Date
Record
Material Description
Material Size
Material Size Description
Outside Diameter
Top of Material
Bottom of Material

Material Description

Material Description defines the type of material described in the record. It could be steel casing, plastic casing, etc. Refer to the coded values for **Material Description** for all possibilities.

DESCRIPTION	CODE
Plastic Casing (unspecified)	PLAS
Steel Casing (unspecified)	STEL
Concrete Liner for Wells	CONC
Timber Lining for Wells	TIMB
Masonry	MASO
Perforated or Slotted Casing Section	PERF
Screen	SCRN
Gravel Pack	GRAV
Open Hole (Section of bore uncased)	OPEN
* Open End Pipe Considered as an Entry Point	ENDD
Cement Grout	GROU
Concrete Plug	PLUG
Polyvinyl Chloride	PVC
Bentonite Seal	BNSL
Stainless Steel	SSL
Medium Density Polythene Pipe	MDPP
Fibreglass Reinforced Plastic	FRP
Acrylonite Butadiene Styrene	ABS
Oil Well Screwed Steel	OIL
Welded Steel Casing or Tubing	WES
Standard Screwed Swelled Black	SSSB
Standard Screwed Swelled Galvanised	SSSG
Slimline Black Steel	SBS
Slimline Galvanised Steel	SGS
Centraliser	CENT
Cuttings or other fill between casing	FILL

* If the open **end** of the pipe terminates in a waterbed it is considered as a water entry point. If the casing terminates anywhere other than in the waterbed it is **not** considered as a water entry point, irrespective of whether the bore continues as an open hole.

Material Size

The **Material Size** describes the wall thickness of a length of casing or aperture of a screen, etc. For plastic casing the wall thickness can be derived from the **Table of Mean Wall Thickness** given at the end of this section, if the class of pipe and its diameter are known. For a gravel pack, the nominal gravel size (i.e. sieve size that all gravel passes) is entered.

UNIT	CODE
Millimetres	MMS
Inches	INS

Values are stored in **millimetres** to three decimal places.

Material Size Description

The **Material Size Description** identifies what attribute the **Material Size** field is measuring. It must have one of the following three codes.

DESCRIPTION	CODE
Wall Thickness of casing	WT
Aperture Size for Screens, Slots, Perforations	AP
Gravel Packs; Nominal gravel size	GR

Note: If you have a material description of GRAV (gravel) you **can not** have a size description of AP or WT. Also if you have a material description of PERF or SCRNL you **can not** have a size description of GR or WT.

Outside Diameter

The **Outside Diameter** of the material is entered in this field.

The term diameter has been chosen because the majority of our facilities are circular in shape. However there will be the occasion when a square or rectangular facility such as a well, trench or excavated pond needs to be entered into the system. In these cases the dimension of the longest side is to be recorded.

UNIT	CODE
Millimetres	MMS
Centimetres	CMS
Metres	MET
Kilometres	KMS
Inches	INS
Feet	FET

Values are stored in **millimetres**.

Top of Material

This field defines the depth from the **natural surface** to the top of the material being described in the record. The top of the casing value must not be greater than the bottom value.

For a string of casing with slots/perforations the **total** length of the string is entered as **one** record (perforated section included). A further record/s is then entered identifying where the slots/perforations occur.

UNIT	CODE
Metres	MET
Feet	FET

Values are stored in **metres** to one decimal place.

Bottom of Material

This field defines the depth from the **natural surface** to the bottom of the material being described in the record. The bottom of the casing value **must not** be marked with a minus sign eg. (-6.00).

For a string of casing with slots/perforations the **total** length of the string is entered as **one** record (perforated section included). A further record/s is then entered identifying where the slots/perforations occur.

UNIT CODE

Metres MET

Feet FET

Values are stored in **metres** to one decimal place.

Mean Wall Thickness

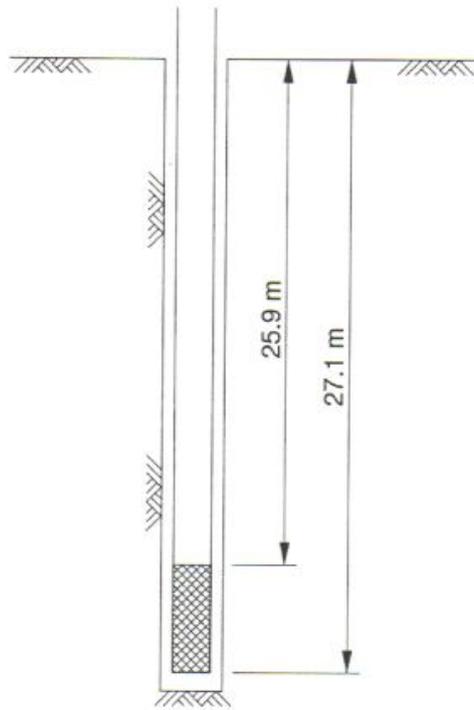
This table was derived from **Australian Standard 1477, Part 1 - 1973 (pipes)**.

CLASS DIAMETER	4.5/A	6/B	9/C	12/D	15/E	18/F
49	-	1.80	2.60	3.35	4.10	4.95
61						
99	2.50	3.25	4.85	6.30	7.75	9.15
115						
124	3.05	4.00	5.90	7.65	9.45	11.25
141						
149	3.45	4.50	6.70	8.80	10.80	12.80
161						
174	4.30	5.65	8.40	10.90	13.55	15.95
198						
199	4.85	6.40	9.35	12.30	15.20	17.95
223						
224	5.35	7.05	10.40	13.65	16.90	19.95
248						
249	6.00	7.85	11.65	15.35	18.90	22.35
281						

NOTES: The mean wall thickness for the numerical classes are not EXACTLY the same as the alphabetic classes according to the standards but are reasonably so.

EXAMPLE 1

RN 90001



CASING DETAILS

DATA ENTRY UNITS

Reg Number: 90001
 Pipe :
 Count:2

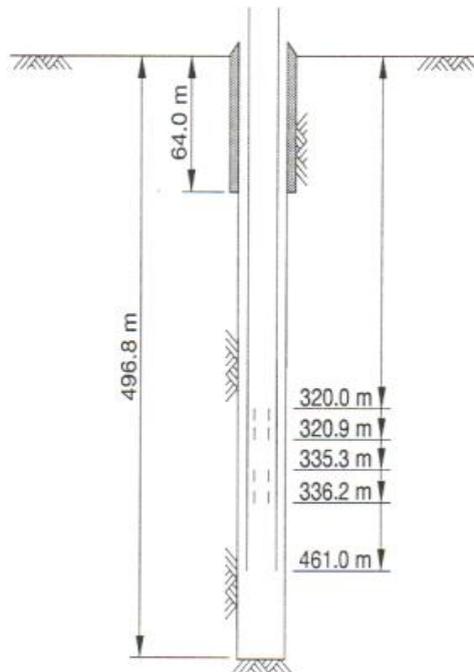
M/Size : MMS
 Diam : MMS
 Top/Bot: MET
 Val:

Pipe	Date	Rcd	Mat Desc	Mat Size	Size Desc	Outside Diameter	Top	Bottom
A	2-1-1991	1	STEL	10.000	WT	150	0.00	25.90
A	2-1-1991	2	SCRN	1.000	AP	125	25.90	27.10

A4-108895

EXAMPLE 2

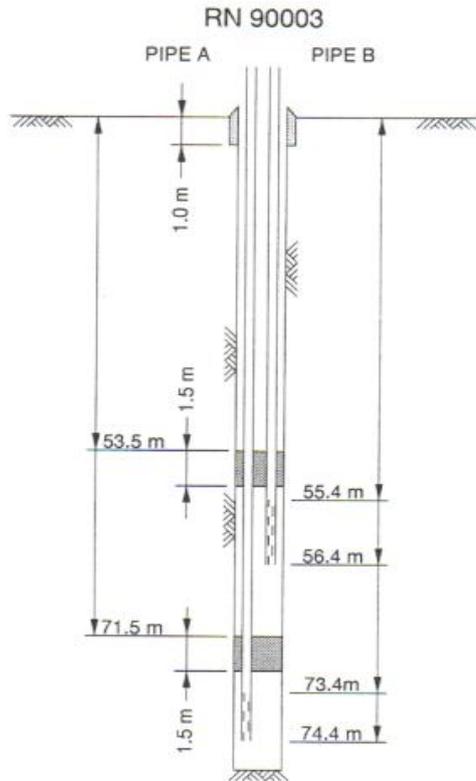
RN 90002



<u>CASING DETAILS</u>							DATA ENTRY UNITS		
Reg Number: 90002							M/Size : MMS		
Pipe :							Diam : MMS		
Count:7							Top/Bot: MET		
							Val:		
Pipe	Date	Rcd	Mat Desc	Mat Size	Size Desc	Outside Diameter	Top	Bottom	
A	3-1-1981	1	STEL	10.000	WT	203	0.00	64.00	
A	3-1-1981	2	STEL	8.000	WT	150	0.00	461.00	
A	3-1-1981	3	PERF	15.000	AP	150	320.00	320.90	
A	3-1-1981	4	PERF	15.000	AP	150	335.30	336.20	
A	3-1-1981	5	ENDD			203	461.00	461.00	
A	3-1-1981	6	OPEN				461.00	496.80	
X	3-1-1981	1	GROU			250	0.00	64.00	

A4-108896

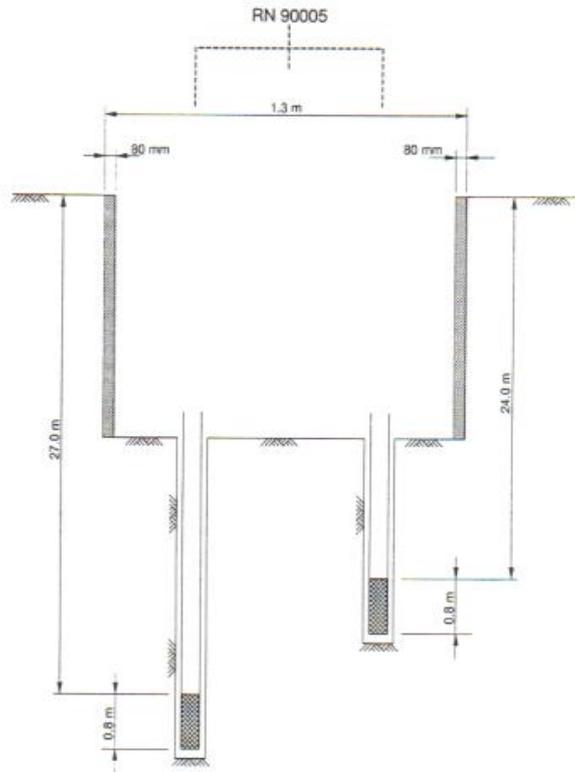
EXAMPLE 3



<u>CASING DETAILS</u>							DATA ENTRY UNITS		
Reg Number: 90003							M/Size : MMS		
Pipe :							Diam : MMS		
Count:7							Top/Bot: MET		
							Val:		
Pipe	Date	Rcd	Mat Desc	Mat Size	Size Desc	Outside Diameter	Top	Bottom	
A	2-2-1982	1	PLAS	1.800	WT	50	0.00	74.40	
A	2-2-1982	2	PERF	1.000	AP	50	73.40	74.40	
B	2-2-1982	1	PLAS	1.800	WT	50	0.00	56.40	
B	2-2-1982	2	PERF	1.000	AP	50	55.40	56.40	
X	2-2-1982	1	GROU			250	0.00	1.00	
X	2-2-1982	2	GROU			203	53.50	55.00	
X	2-2-1982	3	GROU			203	71.50	73.00	

A4-108897

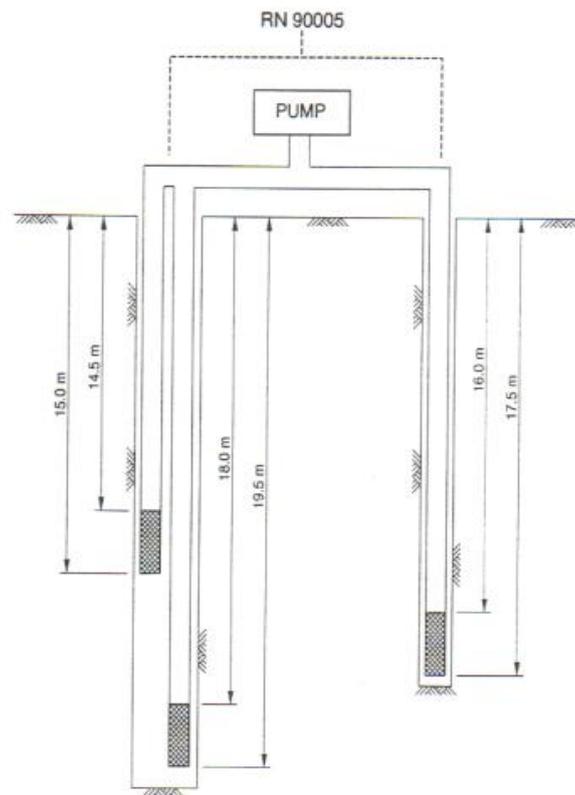
EXAMPLE 4



<u>CASING DETAILS</u>							DATA ENTRY UNITS		
Reg Number: 90005							M/Size : MMS		
Pipe :							Diam : MMS		
Count:5							Top/Bot: MET		
							Val:		
Pipe	Date	Rcd	Mat Desc	Mat Size	Size Desc	Outside Diameter	Top	Bottom	
A	6-9-1982	1	STEL	6.000	WT	100	10.00	27.00	
A	6-9-1982	2	SCRN	0.100	AP	80	27.00	27.80	
B	6-9-1982	1	STEL	9.000	WT	175	10.00	24.00	
B	6-9-1982	2	SCRN	0.100	AP	150	24.00	24.80	
C	1-6-1981	1	CONC	80.000	WT	1300	0.00	10.00	

A4-108898

EXAMPLE 5



CASING DETAILS							DATA ENTRY UNITS		
Reg Number: 90007							M/Size : MMS		
Pipe :							Diam : MMS		
Count:6							Top/Bot: MET		
							Val:		
Pipe	Date	Rcd	Mat Desc	Mat Size	Size Desc	Outside Diameter	Top	Bottom	
A	1-4-1983	1	STEL	3.175	WT	101	0.00	18.00	
A	1-4-1983	2	SCRN	0.229	AP	76	18.00	19.50	
B	1-4-1983	1	STEL	3.175	WT	101	0.00	16.00	
B	1-4-1983	2	SCRN	0.178	AP	101	16.00	17.50	
C	1-4-1983	1	STEL	3.175	WT	101	0.00	14.50	
C	1-4-1983	2	SCRN	0.254	AP	76	14.50	15.00	

A4-108899

STRATA LOG TABLE

INTRODUCTION

The records in this table are a transcription of the strata encountered in a bore as described on the strata log sheet completed by the driller, geologist, etc. This table **must not** be used for storing notes. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_strlogs**

Column Names

Registered Number
Record
Top of Strata
Bottom of Strata
Strata Description or Notes

Top of Strata

The depth from the **natural surface** to the top of the strata described is recorded in this column. The top of the strata log value must not be greater than the bottom value.

UNIT CODE

Metres MET
Feet FET

Values are stored in **metres** to two decimal places.

Bottom of Strata

The depth from the **natural surface** to the bottom of the strata described is recorded in this column. The bottom of the strata log value **must not** be marked with a minus sign eg. (-6.00).

UNIT CODE

Metres MET
Feet FET

Values are stored in **metres** to two decimal places.

Strata Description

The description of strata in the interval defined by **Top of Strata** and **Bottom of Strata** fields is entered here. If the description requires more than one record, the required records can be added without **Top of Strata** and **Bottom of Strata** fields being repeated.

When entering strata log details into the database, make sure the whole log, as recorded by the driller, or hydrologist is entered. Do not abbreviate the logs, i.e. do not leave out colour, granularity, or any descriptive terms.

Please refrain from entering standing water levels or pump test details in this field. If you must make sure you enter the data into the aquifer table or pump test table as well.

Reserved Numbers

In the past, specific record numbers in this table have been reserved to store miscellaneous data. **These reserved numbers should no longer be used, and the data relating to these numbers should be relocated into the appropriate tables.** The Reserved Record Numbers that were used are given in the following table:

You cannot enter a number equal to 900 or greater in the rec field of this table.

OLD RESERVED RECORD NO	PURPOSE
901	Reserved for recording the number of test holes associated with this bore. This data can now be recorded in the general notes table, if necessary. Each test hole should be given a unique registered number, and all available data entered into the database.
902	Records the date, standing water level measurement from natural surface and temperature of water. This record was used to preserve data in records removed from the Pumping Test table. For new bores no entry should be made here, as SWLs must be entered in Aquifer, Water Level or Pumping Test and Design Tables as appropriate. Temperatures must be placed in the water quality field measurement table.
903	Reserved for recording the date, estimated water yield (giving units) and method of testing. This data can now be entered in the aquifer table.
910 TO 920	Reserved for recording water quality descriptions or conductivities for the various waterbeds (up to ten) in a bore. The depth intervals to which the water quality data refers were entered in the top and bottom of strata fields in the table. This data is now catered for in the aquifer table.

AQUIFER TABLE

INTRODUCTION

The purpose of this table is to record information about the permeable water bearing beds encountered by a bore penetrating a single geological unit or a number of geological units. The number of records per bore is limited to 99. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

For data to qualify for entry to this table they must conform to both of the following:

- (i) There must be evidence that the bed has a much higher permeability than the rocks surrounding it.
- (ii) There must be evidence that the bed is capable of yielding water.

Oracle Table Name: **gw_aquifrs**

Column Names

Registered Number
Record
Top of Aquifer
Bottom of Aquifer
Date of Standing Water Level
Standing Water Level of Aquifer when drilled
Flow Indicator
Quality of water in Aquifer
Yield from Aquifer
Contributing Aquifer
Condition
Lithology
Formation Name

Top of Aquifer

The depth from **natural surface** to the top of the aquifer described is recorded in this field. The top of the aquifer value must not be greater than the bottom value.

UNIT	CODE
Metres	MET
Feet	FET

Values are stored in **metres** to two decimal places.

Bottom of Aquifer

The depth from **natural surface** to the bottom of the aquifer described is recorded in this field. The bottom of the aquifer value **must not** be marked with a minus sign eg. (-6.00).

UNIT	CODE
Metres	MET
Feet	FET

Values are stored in **metres** to two decimal places.

Date of Standing Water Level

This field records the date on which the standing water level stored in the 'standing water level of aquifer when drilled' field was taken.

Standing Water Level of Aquifer When Drilled

The Standing Water Level of Aquifer when Drilled field is used to record the water level or static head **measured from natural surface** for each aquifer, when the bore was drilled. Water levels below ground level must be entered as a negative. If the bore is flowing the static head is entered as a positive measurement above ground level.

UNIT	CODE
Metres	MET
Feet	FET
Millimetres of Mercury	MMM
Feet of Mercury	FTM
Kilopascals	KPA
Pounds per Square Inch	PSI

Values are stored in **metres** to two decimal places.

Flow Indicator

In many cases it is known that an aquifer has yielded a flowing water supply, however there are no details of the static head. This field indicates whether or not the water level of the aquifer rose above ground level. ie. Is this artesian?

If a flow is encountered in the aquifer specified, **Y** is entered.

If the water level is below ground level **N** is entered.

Quality of Water in Aquifer

This field is used to indicate the quality of water in an aquifer.

If a full water sample has been taken the Analysis Number may be entered. eg SEE ANAL 123456.

If field measurements such as conductivity and temperature have been taken, these measurements must be entered in the field measurement table. A note indicating this may be made in this field. eg. SEE FIELD MEAS.

In many cases, only a comment regarding the quality of the water is made eg. BRACKISH. In these cases, the comment should be entered.

Yield From Aquifer

The Yield from Aquifer field stores an estimate of the yield from the aquifer. The estimate may be obtained by bailing, air test, pump test, flow test etc.

UNIT	CODE
Litres/second	LS
Cubic metres/day	MD
Gallons/hour	GH
Gallons/day	GD

Values are stored in **litres/second** to two decimal places.

Contributing Aquifer

The Contributing Aquifer field is completed with **Y** (Yes) if the Aquifer contributes to the supply in the completed bore. This is the default entry.

If the aquifer is not contributing to the supply of the completed bore the field is completed with **N** (No).

Condition

Condition refers to the hydrological and physical condition of the material in the bed. However the **hydrological aspect** is dominant. Basically the **condition** is determined by the mechanism by which water is transmitted in the rock mass i.e. is the water transmitted via pores, between grains or via fractures in the rock mass?

DESCRIPTION	CODE
<u>Porous Rocks</u>	
Unconsolidated	UC
Consolidated	PS
Semi-Consolidated	SC
<u>Fractured Rocks</u>	
Fractured	FR
Vesicular	VS
Cavernous	CV
Weathered Zone	WZ

Lithology

The Lithology describes the type of material encountered in the waterbed described. As many codes as necessary may be used. The sequence number denotes which is most dominant to least dominant. Lithologies are stored in a separate table, not the aquifer table.

DESCRIPTION	CODE
Sand	SAND
Sandy Clay	SANC
Clayey Sand	CSAN
Gravel	GRAV
Clayey Gravel	CGRY
Clay	CLAY
Clayey Silt	CSIL
Silt, Silty	SILT
Mudstone	MDST
Siltstone	SSTO
Sandstone	SDST
Conglomerate	CONG

Shale	SHLE
Limestone	LMST
Dolomite	DLMT
Coal	COAL
Dolerite	DOLE
Chert, Jasper	CHER
Basic Volcanic e.g. Basalt	BSLT
Basic Intrusive e.g. Gabbro	GBRO
Intermediate Volcanic e.g. Trachyte - Andesite	TCHY
Intermediate Intrusive e.g. Syenite - Diorite	SYNE
Rhyolite, Acid Volcanic e.g. Rhyolite - Dacite	RHYO
Acid Intrusive, Granite	GNTE
Volcanic (Undifferentiated)	VOLC
Intrusive (Undifferentiated)	INTR
Slate	SLAT
Schist	SCHT
Gneiss	GNSS
Mud	MUDD
Boulder/s	BLDR
Metamorphics	META
Volcanic Ash	VASH
Tuff	TUFF
Agglomerate	AGGL
Sedimentary (unidentified)	SEDI
Loam	LOAM
Unknown	XXXX

Formation Name

Formation Name is the name of the **geological unit** containing the aquifer being recorded. The source of data to be entered in this field is the formation names on published maps or in published documents from either the Bureau of Mineral Resources or **The Department of Minerals and Energy**.

Alluvium is to be treated as a lithological formation and **not** a formation name. The **Formation Name** is to consist of the name of the river, creek or geographic feature commonly used to describe the alluvium of an area.

All formation names entered into this field are validated against those entered in the Geological Formations Table.

ELEVATION TABLE

INTRODUCTION

This table records the **Elevation** of the ground immediately surrounding the borehole before it is drilled, and the elevation of reference points on bores and surface water facilities used for regular water level measurements.

A special condition exists for this table. The values for elevation that existed in this table in **October 1982**, were used to derive the measurements in the Water Level table. No amendment should therefore be made to any elevation value with a date prior to October 1982, unless the water levels are also amended. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_elvdets**

Column Names

Registered Number
Pipe
Date
Elevation
Measurement Point
Datum
Precision
Source of Detailed Survey

Date

For reference point elevations it is most important that the **Date** is recorded correctly so that all the water level measurements taken can be reduced to water level elevations. It must be ensured that the **Date** is the day the reference point **was established** and used for measurement and not the date on which it was surveyed.

When a subsequent reference point is established at a different elevation from the original (e.g. when repaired after damage) a new record must be created. The **Date** again, should be the date the point was established and not the date it was surveyed.

This "history" of reference points then enables the plotting programs to use the appropriate elevation by **Date** to calculate the correct elevations of the measurements in the **Water Level Table**.

Elevation

The **Elevation** is the elevation of natural surface or the Elevation of the reference point, in relation to a datum. A positive value indicates the point is above the datum and a minus value shows it is below the datum. A positive sign is understood. A negative sign must be entered in the field with the value for **Elevation**.

Units

The only unit allowed is **metres** to two decimal places.

Measurement Point

The **Measurement Point** field is used to denote whether the **Elevation** recorded is for the natural surface or the reference point. If the pipe entered is A,B,C,D,E,F a measuring point of Natural Surface (N) cannot be entered in this field. Also if the pipe is X a measuring point of Reference Point (R) cannot be entered in this field.

DESCRIPTION	CODE
Elevation of Natural Surface	N
Elevation of Reference Point	R

Datum

The **Datum** defines to which **Datum** the **Elevation** is related.

DESCRIPTION	CODE
Australian Height Datum	AHD
State Datum	STD
Assumed Datum	ASS

Precision

The **Precision** indicates the accuracy of the **Elevation** data recorded.

DESCRIPTION	CODE
Surveyed	SVY
Aneroid Barometer	BAR
An Estimate using Contours	EST
Global Positioning System	GPS

Source of Survey Details

This field is only to provide further information on instrument surveys i.e. where the **Precision** field is completed as "SVY". So the detailed information can be found quickly, this field has been made available with only three possibilities existing.

DESCRIPTION	CODE
No record can be found of the elevation calculations.	NOREC
The survey details exist on the "WaterCARDS Level Observation Point Survey Data Sheet", WRC 973.	CARDS
If a survey was recorded in a field book e.g 12345 and registered in Head Office the field book registered number should be entered.	12345

WATER LEVEL TABLE

INTRODUCTION

This table records water level measurements taken from water level measuring points. The entries will usually come from the bore water level monitoring network and associated surface water facilities.

All water level measurements in this table with dates prior to **October 1982** were derived using Elevation data. Consequently if amendments are required to water levels prior to October 1982 the data in the **Elevation Table** may also require amendment. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_wlvdets**

Column Names

Registered Number
Pipe
Date
Measurement
Measurement Point
Remark
Logger

Measurement

The water level **Measurement** refers to the distance from the natural surface or reference point to the water surface in a sub-artesian bore when it is in a fully recovered state. At a surface water gauge the **Measurement** will be the distance to the water surface from the gauge zero (reference point).

Standing water level measurements can be measured either up or down from a reference point. **Measurements** up from a reference point are recorded as a positive value with the sign understood. **Measurements** down must have a minus sign entered

in the field with the value for the **Measurements**. Shallow bores which flow intermittently should have the head measured accurately if possible. If not measured the **Measurement** should be recorded as zero.

Numerous records for this table are derived from automatic water level recorders. This data has to be extracted from the tape or charts produced, and entered manually.

It is not necessary to enter a reading for every day. Only sufficient points need to be entered into the computer such that a plot of the points shows the significant water level behavior.

The frequency of entries depends on the variation in water level. For example a constant decline in water level of 0.5m per day over a four-week period would require only the first and last water levels to be entered. If the decline began at 0.1m per day and increased gradually to 0.5m per day then sufficient entries must be made to enable reproduction of the decline curve.

A measurement that is below the casing seat of the bore will not be accepted by the database. Also a warning will appear if a measurement entered is above the maximum water level or below the minimum water level for the bore.

UNIT	CODE
Metres	MET
Feet	FET
Millimetres of Mercury	MMM
Feet of Mercury	FTM
Kilopascals	KPA
Pounds per Square Inch	PSI

Values are stored in **metres** to two decimal places.

Measurement Point

Water level **Measurements** can be taken from natural surface or a reference point. The latter is the most usual in relation to the Department's water level measuring network. Water level **Measurements** are generally only taken from natural surface when a bore is under construction. This field allows the point from where the **Measurement** was taken to be defined. It is essential for the correct reduction of a water level to an elevation.

DESCRIPTION	CODE
Natural Surface	N
Reference Point	R

Remark

This field qualifies the water level **Measurement**. If a water level has been taken that is not affected by a bore pumping nearby then there is no need to fill this field in. If a water level has been taken after a bore has been purged then there is a need to fill this field in. If a bore is dry the depth from the reference point to the screen seat must be entered in the **Measurement** field and the code for dry entered in this field. Bores that are "dry" because they are blocked must **not** have a record entered for that visit.

If the facility is a surface water facility and there is no water to measure to, then the **Measurement** down to ground level from the reference point should be entered along with the code for **dry** in this field.

DESCRIPTION	CODE
Dry	D
Bore Purged	B
Pumping Nearby	P

Logger

This field is a read-only field that indicates to the user if the water level record has been taken from a bore logger or manually. If the record has been taken from a bore logger device this field will be populated with an 'L' which stands for Logger. If the field is blank then it is assumed the water level record has been taken manually.

The reason for identifying the water level records which have been taken from a bore logger device is that the water level measurement has been calculated from multiple readings over the day and converted to an average daily mean value.

WATER QUALITY FIELD MEASUREMENT TABLE

INTRODUCTION

This table records water quality measurements that have been **taken in the field**. This will commonly be done while measuring water levels. Any parameter made available from full laboratory analyses must **not** be entered in this table.

A special table, **Multiple Conductivity** is provided for the series of conductivity measurements taken in bores monitoring salt-water intrusion, and hence should not be entered in this table. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_fieldqs**

Column Names

Registered Number
Pipe
Date
Depth
Conductivity
pH
Temperature
Nitrate
Dissolved Oxygen
Redox Potential
Remark
Source

Date

The date to be entered is the date on which the field measurement was taken.

Depth

The **Depth** can be recorded to two decimal places. It must be entered as, and is stored as, metres. The value stored in this field is always a measurement below the natural surface level and can only be entered as a positive value.

Bores during construction, deepening or alteration

a. No casing or packer inserted

If no device was isolating a section of the borehole at the time of sampling, insert the depth from natural surface to the bottom of the deepest waterbed at the time.

b. Casing or Packer Inserted

If part of the hole was isolated by any device at the time of sampling, insert the depth from natural surface to the bottom of the deepest waterbed in the interval sampled.

Bores completed

a. No packer used

Insert the depth from natural surface to the bottom of deepest water entry point i.e. the bottom of the screen, deepest slot, or bottom of deepest bed in any uncased section of the hole.

b. Packer Used

Insert the depth from the natural surface to the bottom of deepest water entry point in the interval sampled.

The value stored in this field is always a measurement below the natural surface level and can only be entered as a positive value.

Surface Water Samples

When a surface water sample is taken the depth below the surface is to be entered.

Values are stored in **metres**.

Conductivity

The **Conductivity** measurement is entered here. It must always be converted to the correct units.

UNITS

The only allowable unit is microSiemens per centimetre at 25 degrees Celsius. For conversion of measurements at other temperatures refer to the conductivity conversion multipliers in the Water Analysis Table section.

pH

This field stores the field pH.

Temperature

This field records the maximum temperature of the discharging water to one decimal place. The data must be entered as, and is stored as, **degrees Celsius**.

Nitrate

This field stores the nitrate measurement taken in the field. The measurement must be entered in **milligrams/Litre**.

Dissolved Oxygen

The Dissolved Oxygen measurement taken in the field is entered in this field. The data must be entered in **milligrams/Litre**.

Eh

The Eh of the water, taken in the field is entered here. The data must be entered in **millivolts**.

Remark

This field describes the method used to collect the sample. The valid codes are given below.

DESCRIPTION	CODE
Bailer – Teflon	BT
Bailer – Other	BA
Pump - Grundfos MP1	PG
Pump - WaTerra	PW
Pump - Amazons	PA
Pump - Bladder	PB
Pump – Peristaltic	PP
Pump - Other or Flowing Bore	PU
Air Lifting	AI
Manual eg. from stream, trough, tank (by hand)	MA
Unknown	XX
Downhole Probe	DH
Sigma Sampler (Auto)	AS
Composite	MX
Not Recorded	NR
Pump – Air Forced	PF
Van Dorn Bottle	SD
Helley Smith Bed Loader Sampler	SH
D49 Intergrated Sediment Sampler	SI
DH48 Intergrated Sediment Sampler	SM
P61 Intergrated Sediment Sampler	SS
P61 Suspended Sediment Sampler	ST
Van Veen Sampler	SV

Source

This field describes the source of the sample. The available codes are:

SOURCE	CODE
Groundwater - Sample from Bore	GB
Groundwater - Sample from Stream or spring	GS
Groundwater - Sample from remote source eg. tank, bore drain	GR

If a bore water sample is not collected directly from the bore, but from some other point distant from the bore, it is classed as a 'remote' sample to indicate it has passed through a distribution system for some distance and thereby resided for an unspecified time in an environment other than the bore's own environment.

Bore water in bore drains, swamps, channels of all types, table drains, turkey nests and dams are to be classed as remote samples from the bore.

Samples collected from surface water sources are dealt with simply by specifying the samples are of surface water origin.

WATER ANALYSIS TABLE

INTRODUCTION

The **Water Analysis Table** stores the results of chemical determinations performed on water samples **by an analyst**. The data entered must be supported by some form of written certification issued by the analyst. Data not supported **must not** be entered (e.g. all form of field measurement including the DNR conductivity measurements, uncertified reports from any source including Water Resources Commission analysis numbers 1 - 3000 inclusive).

Fluoride values from the Fluoride Survey are admissible.

All analyses done since **January 1990** by QUEENSLAND HEALTH SCIENTIFIC SERVICES (formerly the Government Chemical Laboratory) will have their results transferred to the Database by Information Management Section. These results account for the bulk of the entries to this table. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_watanls**

Column Names

Registered Number
Pipe
Date
Record
Analysis Units (not stored)
Analyst
WR Analysis Number
Remark
Source
Preservation Method
Collection Authority
Project
Depth
Conductivity
pH
*Colour
*Turbidity
*Silica
*Hardness
*Alkalinity
#Figure of Merit
#Sodium Adsorption Ratio
#Residual Alkalinity Hazard
#Total Dissolved Ions
#Total Dissolved Solids
*Sodium
*Potassium
*Calcium
*Magnesium
*Iron
*Manganese
*Zinc
*Aluminium
*Boron
*Copper
*Bicarbonate
*Carbonate
*Chloride
*Fluoride
*Nitrate
*Sulphate
*Phosphate

Notes:

* Indicates that the values also have a flag field stored in the database.

Note: These values are calculated

Results are obtained on clear settled unfiltered sample unless otherwise indicated.

Calculated Values

For the calculated values shown previously, the following notes are given by QUEENSLAND HEALTH SCIENTIFIC SERVICES and apply to their analyses.

Total Dissolved Ions = Total Cations + Total Anions.

Total Dissolved Solid = Silica + Total Cations + Total Anions - ($\text{HCO}_3^- \times 0.583$); i.e.

Bicarbonate is expressed as Carbonate.

Hardness is ($\text{Ca}^{++} + \text{Mg}^{++}$) as CaCO_3 .

Residual Alkalinity = $\text{meq}(\text{HCO}_3^- + \text{CO}_3^{--}) - \text{meq}(\text{Ca}^{++} + \text{Mg}^{++})$.

Sodium Adsorption Ratio = $\text{meqNa}^+ / \sqrt{\text{meq}(\text{Ca}^{++} + \text{Mg}^{++})/2}$.

Figure of Merit (Ratio) = $\text{meq}(\text{Ca}^{++} + \text{Mg}^{++}) / \text{meqNa}^+$.

Saturation Index (Langelier) = pH-pHs.

Handling Samples

The procedure for forwarding samples to an analyst is described in the DNR Report *Water Sample Processing Procedure*.

Analyst

The field **Analyst** defines the organisation that performed the analysis. The valid codes are given below.

ANALYST	CODE
Qld Department of Primary Industries Agricultural Chemist	DPI
Government Chemical Laboratory	GCL
Brisbane City Council	BCC
Simmonds and Bristow	S&B
Toowoomba City Council	TCC
Cairns City Council	CCC
University of New South Wales	UNS
BSES – Burdekin	BSA
BSES – Indooroopilly	BSI
Aust. Coal Industry Research Laboratories	ACI
Australian Environmental Laboratories	AEL
AIS McCracken P/L	AIS
Australian Laboratory Services	ALS
AMDEL Townsville	AMD
Bundaberg Analytical Services	BAS
BSES – Mackay	BSM
Cargo Superintendent Company	CAS
Cambooya Shire Council	CSL
Crop Tech Laboratories	CTL
Department of Mines & Energy	DME
Department of Natural Resources	DNR
Energex	EGX
Societe Generale de Surveillance	SGS
University of Central Queensland	UCQ
University of Queensland	UOQ
Unknown	XXX

DNR Analysis Number

Insert the **DNR Analysis Number** quoted on the certificate.

Where an analyst leaves the **DNR Analysis Number** field blank, a **DNR Analysis Number** should be issued. A new number should also be issued when an old analysis is located with no **DNR Analysis Number**.

Remark

This field describes the method used to collect the sample.
The valid codes are given below:

DESCRIPTION	CODE
Bailer – Teflon	BT
Bailer – Other	BA
Pump - Grundfos MP1	PG
Pump - WaTerra	PW
Pump - Amazons	PA
Pump - Bladder	PB
Pump – Peristaltic	PP
Pump - Other or Flowing Bore	PU
Air Lifting	AI
Manual eg. from stream, trough, tank (by hand)	MA
Unknown	XX
Downhole Probe	DH
Sigma Sampler (Auto)	AS
Composite	MX
Not Recorded	NR
Pump – Air Forced	PF
Van Dorn Bottle	SD
Helley Smith Bed Loader Sampler	SH
D49 Intergrated Sediment Sampler	SI
DH48 Intergrated Sediment Sampler	SM
P61 Intergrated Sediment Sampler	SS
P61 Suspended Sediment Sampler	ST
Van Veen Sampler	SV

Source

This field describes the source of the sample. The available codes are:

SOURCE	CODE
Groundwater - Sample from Bore	GB
Groundwater - Sample from Stream or spring	GS
Groundwater - Sample from remote source eg. tank, bore drain	GR

If a bore water sample is not collected directly from the bore, but from some other point distant from the bore, it is classed as a 'remote' sample to indicate it has passed through a distribution system for some distance and thereby resided for an unspecified time in an environment other than the bore's own environment. Bore water in bore drains, swamps, channels of all types, table drains, turkey nests and dams are to be classed as remote samples from the bore.

Samples collected from surface water sources are dealt with simply by specifying the samples are of surface water origin.

Preservative

Enter here the codes for the types of preservative that were used. Up to three codes may be entered. The valid preservative codes are:

PRESERVATION METHOD	CODE
Chilled - 4 degrees C	CH
Frozen	FR
Lugol	LU
Magnesium Carbonate	MC
Acid – Nitric	AN
None Required	NL
Not Recorded	NR

Sodium Hydroxide	NH
Acid – Sulphuric	AS
Kept in Darkness	DA
Potassium Dichromate	PD
Methanol	ME
Acid – Hydrochloric	AH
Acid – Orthophosphoric	AO
Zinc Acetate	ZA
Acid - Ascorbic	AA
Cadmium Nitrate	CN
Mercuric Iodide	MI
Unknown	XX
Exclude Air	EA
None Used, but required	NU

Collection Authority

This field is used to record which authority collected the sample. The Queensland Department of Natural Resources has a number of subgroups, to further identify the collection authority.

The valid codes are:

AUTHORITY	CODE
DNR – Agricultural	DA
DNR - Community Landcare Group	DC
DNR – Groundwater	DG
DNR – Hydrographic	DH
DNR - Integrated Catchment Management	DI
DNR – LAS	DL
DNR – Operations	DO
DNR - Water Watch Group	DW
DNR - Scientist	DS
Private	PR
Qld Health Department	QH
Qld Department of Minerals and Energy	QM
Australian Geological Survey Organisation	AG
Unknown	XX
Qld Department of Environment and Heritage	QE
Qld University of Technology	UT
Not Recorded	NR

Project

This field describes for which project the sample was taken. The project can be up to 10 characters in length.

The valid codes are:

PROJECT	CODE
Groundwater Ambient Network	GWAN
Cape York Peninsula Land Use Study	CYPLUS
Project Unknown	XX
Private	PR
Atherton Basalt Project	ABP
Artesian Bore Replacement Program	ABRP
Blue Green Algae Research	BGAR
Burdekin River Special Investigation	BRSI
Feedlot Waste Management Invest.	FWMI
Kingston Hazardous Waste Project	KHWP
National Action Plan	NAP
Pilot Groundwater Biota Study	PGBS
St George Irrigation Survey	STIAS

Depth

The **Depth** can be recorded to two decimal places. It must be entered as, and is stored as, metres. The **DEPTH** can be recorded to two decimal places. It must be entered as, and is stored as, metres. The value stored in this field is always a measurement below the natural surface level and can only be entered as a positive value.

Bores during construction, deepening or alteration

a. No casing or packer inserted

If no device was isolating a section of the borehole at the time of sampling, insert the depth from natural surface to the bottom of the deepest waterbed at the time.

b. Casing or Packer Inserted

If part of the hole was isolated by any device at the time of sampling, insert the depth from natural surface to the bottom of the deepest waterbed in the interval sampled.

Values are stored in **metres**.

Bores completed

a. No packer used

Insert the depth from natural surface to the bottom of deepest water entry point i.e. the bottom of the screen, deepest slot, or bottom of deepest bed in any uncased section of the hole.

b. Packer Used

Insert the depth from the natural surface to the bottom of deepest water entry point in the interval sampled.

Values are stored in **metres**.

Surface Water Samples

When a surface water sample is taken the depth below the surface is to be entered.

Values are stored in **metres**.

Result Flag

This field is used when the result of the analysis is greater or less than a value, not detected, too numerous or trace. The valid codes are as follows:

FLAG	CODE
Less Than	<
Greater Than	>
Not Detected	ND
Too Numerous	TN
Trace	TR

Chemical Data - IONS

Transcribe Chemical Data directly from the analysis certificate if a field exists for the ions on the data preparation form. If Conductivity is referred to a temperature other than 25 degrees Celsius convert it to 25 degrees Celsius using the table given in this section. Round off the calculated result to the nearest

"ten" e.g. 1731.86 (calculated) rounds to 1730, 565.09 rounds to 570, as does 565.00.

The results shown on some analyses as T, O or N for Trace, Not Detected and Not Determined are not valid values. The entries should be written as **0.0** for Trace, **0.0** for Not Detected and blank for Not Determined. Only numbers and blanks will be stored.

The data will be stored as **milligrams per litre** for all quantities **except**:

1. Conductivity stored as **microSiemens per centimetre** at **25** degrees Celsius.
2. pH stored as a **number**.
3. Residual Alkalinity stored as **milli-equivalents per litre**.
4. Sodium Adsorption Ratio stored as a **number**.
5. Figure of Merit stored as a **number**.
6. For Fluoride, only values between **zero** and **30** milligrams per litre are valid.
7. Turbidity is stored in NTU.
8. Colour is stored in Hazen.

Parts per million are to be treated as **milligrams per litre** and the code for milligrams per litre (MGL) used. Treating parts per million in this way introduces some errors at very high concentrations but the majority of results are not altered significantly.

Where an analysis is presented partly in milligrams per litre (or ppm) and partly in some other unit, convert all data to the **one** set of units.

UNIT	CODE
Milligrams per litre OR parts per million	MGL
Milli-equivalents per litre OR equivalents per million	MEL
Grains per gallon	GPG

Values are stored in **milligrams per litre**.

Table of Conductivity Conversion Multipliers

Temperature at which Conductivity Reported

DEGREES CELSIUS	MULTIPLIERS
15:	Multiply reported conductivity by 1.2
16:	Multiply reported conductivity by 1.18
17:	Multiply reported conductivity by 1.16
18:	Multiply reported conductivity by 1.14
19:	Multiply reported conductivity by 1.12
20:	Multiply reported conductivity by 1.10
21:	Multiply reported conductivity by 1.08
22:	Multiply reported conductivity by 1.06
23:	Multiply reported conductivity by 1.04
24:	Multiply reported conductivity by 1.02
25:	No conversion required
26:	Multiply reported conductivity by 0.98
27:	Multiply reported conductivity by 0.96
28:	Multiply reported conductivity by 0.94
29:	Multiply reported conductivity by 0.92
30:	Multiply reported conductivity by 0.90

MULTIPLE CONDUCTIVITY

INTRODUCTION

This table records conductivity measured at various depths down the hole in bores monitoring salt-water intrusion. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_mulcnds**

Column Names

Registered Number
Pipe
Date
Depth
Measurement
Temperature

Depth

The **Depth** field is the depth in metres from the reference point to the point at which the conductivity measurement was taken. For sub-artesian bores this field will be negative indicating the measurement is taken below the reference point.

Units

The only unit allowed is **metres**.

Measurement

The **Measurement** field stores the conductivity reading in micro Siemens per centimetre at 25 degree Celsius.

Temperature

This field stores the **Temperature** of the water, taken at the corresponding **Depths**.

Units

The only allowable unit is **degrees Celsius**.

STRATIGRAPHY TABLE

INTRODUCTION

The data in this table stores the interpreted stratigraphy of many of the water and oil bores in the Great Artesian Basin. The stratigraphic interpretation may have been made by the Queensland Department of Minerals and Energy or the Queensland Water Resources or some other government body or company. Any interpretation made by the Queensland Department of Minerals and Energy will have a source code of DME, and the data must not be altered, as it will be overwritten from time to time. Note: If the bore has a facility status of PROPOSED you cannot insert, update or delete data from this table until you change the facility status to EXISTING.

Oracle Table Name: **gw_strtigs**

Column Names

Registered Number
Source
Record
Top of Unit
Bottom of Unit
Description

Source

The source field describes the organisation that analysed the available data and made the stratigraphic interpretation. The following sources are acceptable.

ORGANISATION	CODE
Department of Natural Resources	DNR
Department of Minerals and Energy	DME
Australian Geological Survey Organisation	AGS
BHP Pty Ltd	BHP
Lockyer Catchment Centre	LCC
Sunwater	SUN
Old Murray Darling Dryland Salinity	MDS
National Action Plan	NAP
Prawn Farm Investments	PFI

Record

Every line for a stratigraphic interpretation done by a different organisation must have a unique line number.

Top of Unit

The top of unit field stores the depth below ground level to the top of the stratigraphic unit (in metres). The top of the stratigraphy value must not be greater than the bottom value.

Bottom of Unit

The bottom of unit field stores the depth below ground level to the bottom of the stratigraphic unit (in metres). The bottom of the logged interval value must not be marked with a minus sign eg. (-6.00).

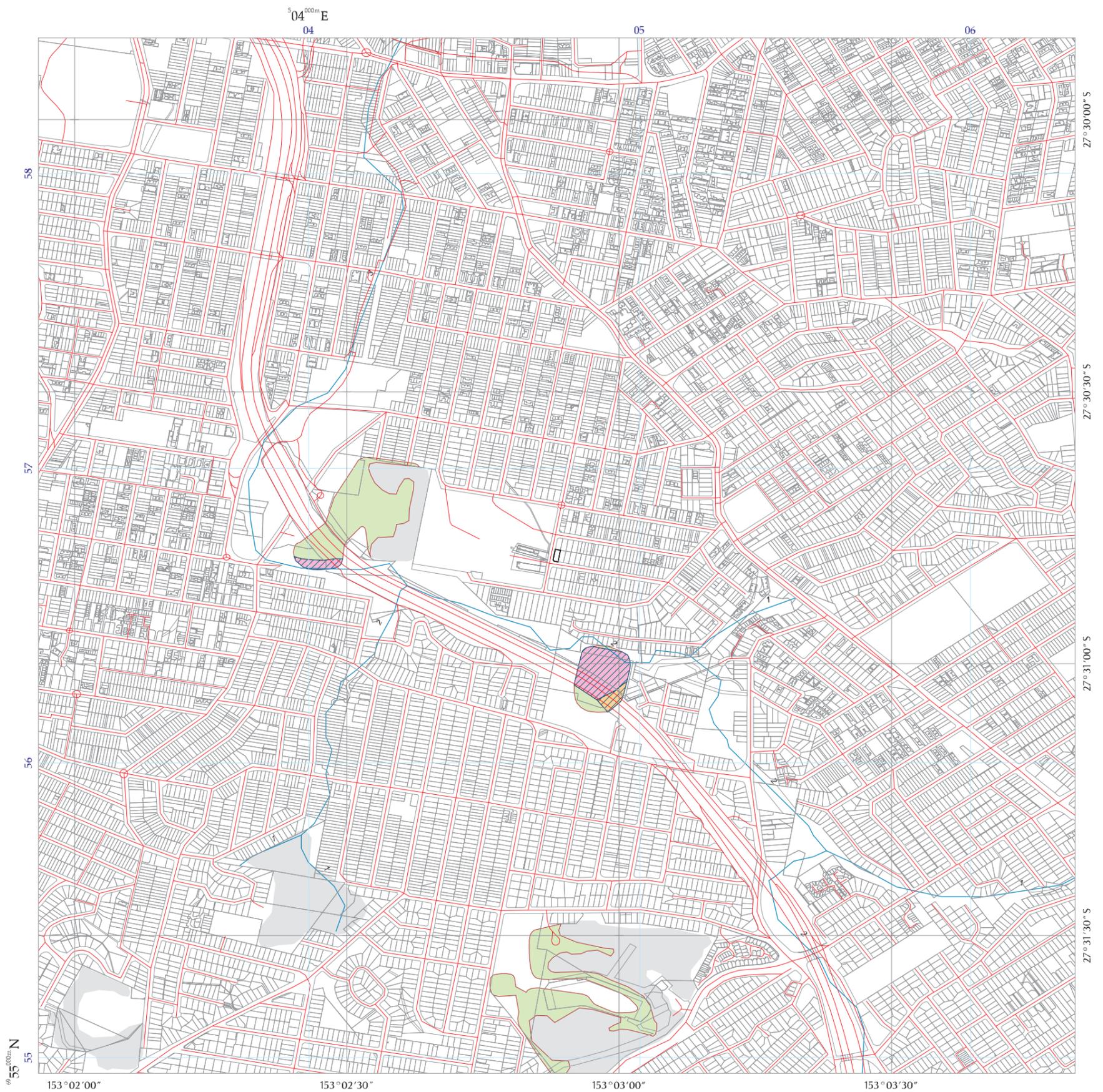
Description

The Description field stores the name of the stratigraphic unit occupying the zone specified.

Appendix F

Regional Ecosystem Search

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



REGROWTH VEGETATION MAP - Version 2.1

-  Vegetation Management Act Essential Regrowth Habitat with example label number
-  Great Barrier Reef Wetland Protection Area
-  High value regrowth vegetation containing Endangered regional ecosystems
-  High value regrowth vegetation containing Of Concern regional ecosystems
-  High value regrowth vegetation that is a Least Concern regional ecosystem
-  Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
-  Non-remnant
-  PMAV Category X area
-  Regrowth watercourse (Stream order shown as black number against stream)
-  Vegetation management watercourse map - version 1.2 (Stream order shown as black number against stream where available)
-  Subject Lot
-  Roads
© Pitney Bowes Software 2012
-  Cadastral line
Property boundaries shown are provided as a locational aid only.
-  Towns

Requested By: GLENDA_JONES@COFFEY.COM
Date: 16 Jul 13 Time: 11.37.55

Centered on Lot on Plan:
125 RP46047

Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot. Labels correlate to the label field in the attached essential regrowth habitat database.

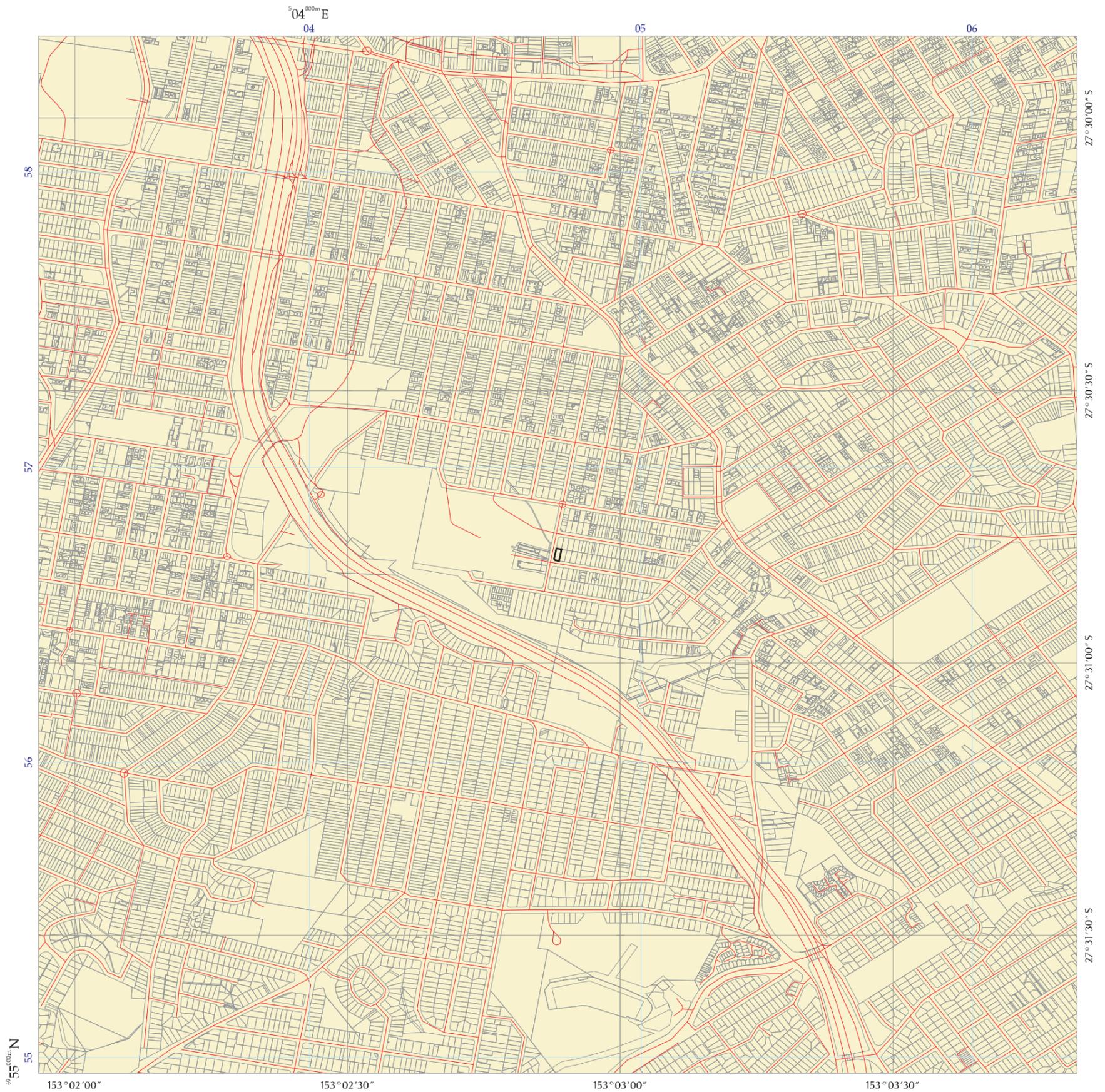
The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.dnrm.qld.gov.au> or contact Vegetation Management, Department of Natural Resources and Mines.



Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.



Property Maps of Assessable Vegetation (PMAVs)

Requested By: GLENDA_JONES@COFFEY.COM
Date: 16 Jul 13 Time: 11.37.57

Centered on Lot on Plan:
125 RP46047

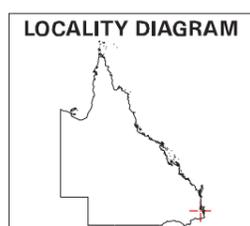
The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.dnrm.qld.gov.au> or contact Vegetation Management,
Department of Natural resources and Mines

Property Map of Assessable Vegetation Vegetation Category Area

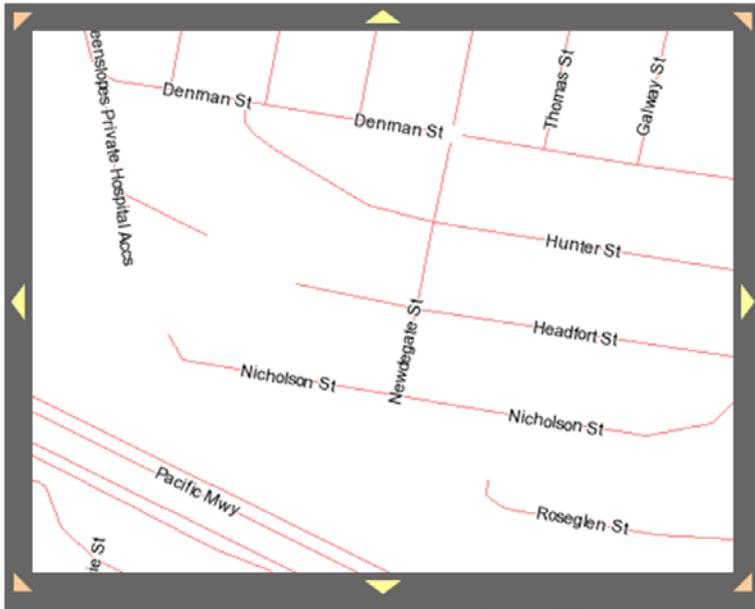
- Category A area
 - Category B area
 - Category C area
 - Category X area
 - Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
 - Subject Lot
 - Roads
 - Cadastral line
 - Towns
- © Pitney Bowes Software 2012
Property boundaries shown are provided as a locational aid only.



Appendix G

Unexploded Ordnance Search

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



Legend:

-  Substantial UXO Potential
-  Slight UXO Potential
-  Other UXO Potential
-  Cadastre with Substantial UXO Potential
-  Cadastre with Slight UXO Potential
-  Cadastre with Other UXO Potential
-  Cadastre outside UXO

Appendix H
Environmental Management Register
Search

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.ehp.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 49369018 EMR Site Id: 16 July 2013
This response relates to a search request received for the site:
Lot: 123 Plan: RP46047

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

From the 1st August 2012, the price of an EMR/CLR search will increase to \$41.55 per lot for internet based searches and \$48.85 per lot for EMR/CLR searches done by means other than the internet.

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Registrar
Administering Authority



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.ehp.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 49369910 EMR Site Id: 18 July 2013
This response relates to a search request received for the site:
Lot: 124 Plan: RP46047

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

From the 1st August 2012, the price of an EMR/CLR search will increase to \$41.55 per lot for internet based searches and \$48.85 per lot for EMR/CLR searches done by means other than the internet.

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Registrar
Administering Authority



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.ehp.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 49369008 EMR Site Id: 16 July 2013
This response relates to a search request received for the site:
Lot: 125 Plan: RP46047

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

From the 1st August 2012, the price of an EMR/CLR search will increase to \$41.55 per lot for internet based searches and \$48.85 per lot for EMR/CLR searches done by means other than the internet.

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Registrar
Administering Authority

Appendix I

Historical Aerial Photographs

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

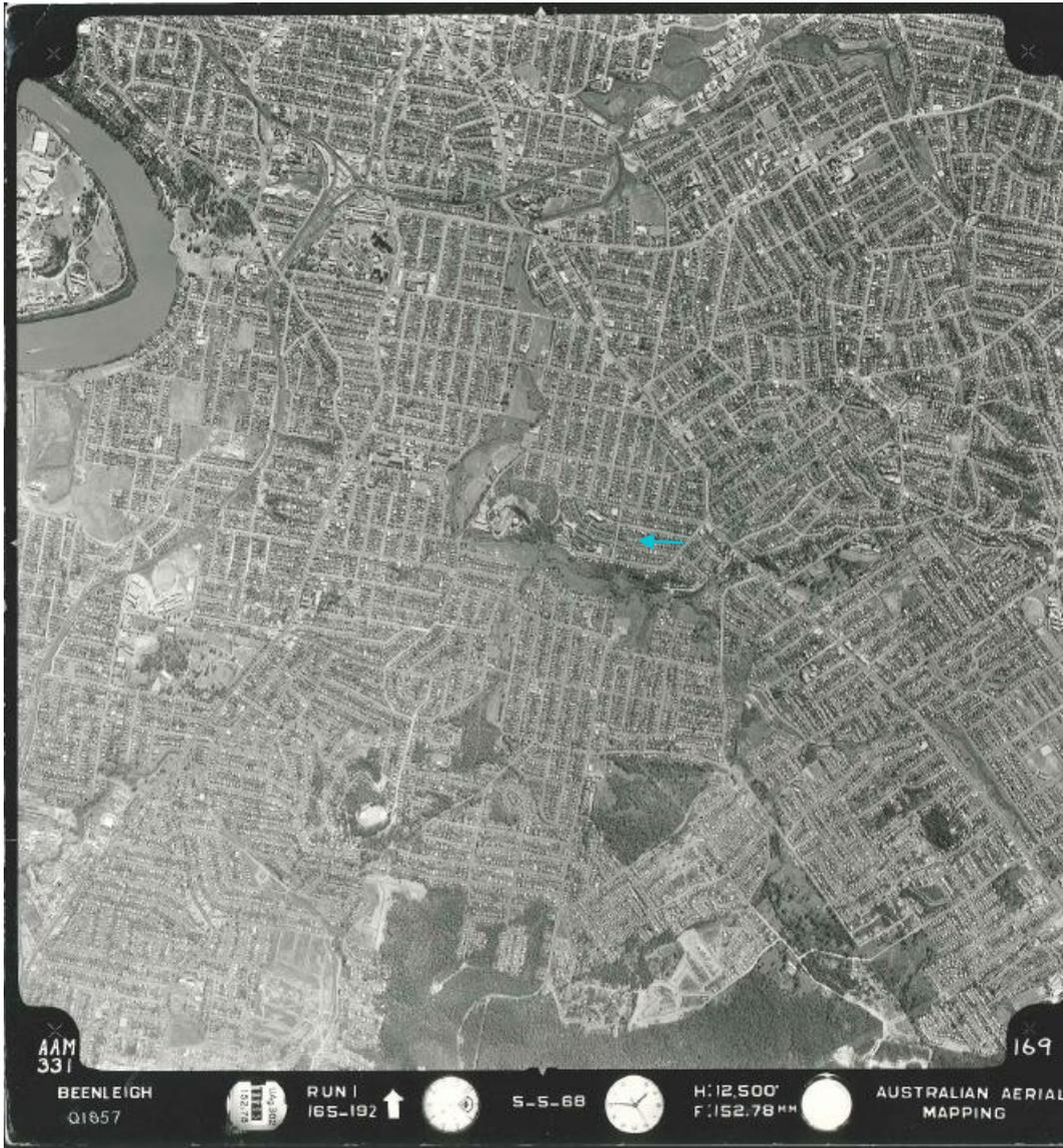
HISTORIC AERIAL PHOTOGRAPHS



Aerial Photograph 1: 01/04/1944 Run 1. Frame 346. Scale 1:33800



Aerial Photograph 1: 27/07/1955 Run 1. Frame 26. Scale 1:25000



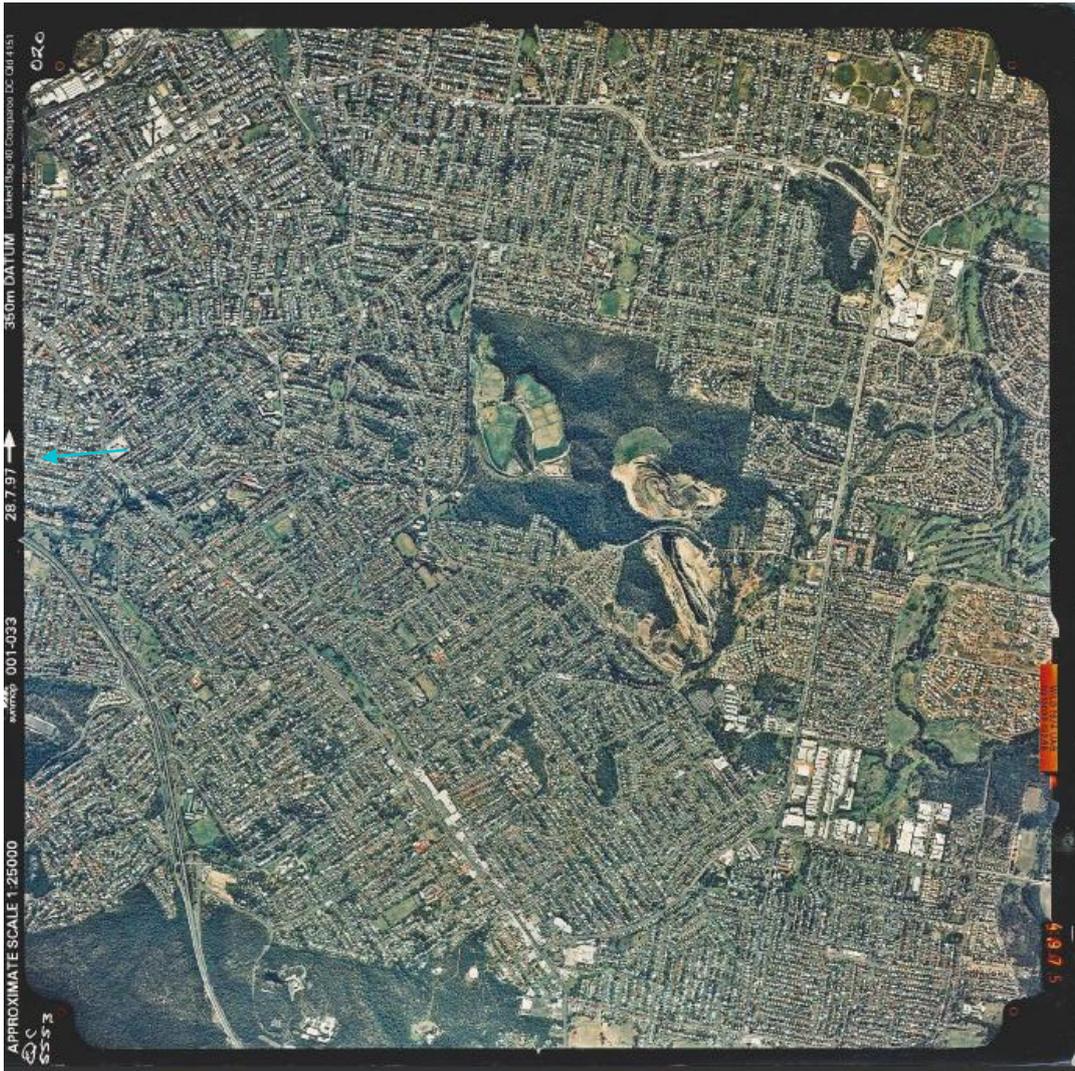
Aerial Photograph 1: 01/05/1968 Run 1. Frame 169. Scale 1:22900



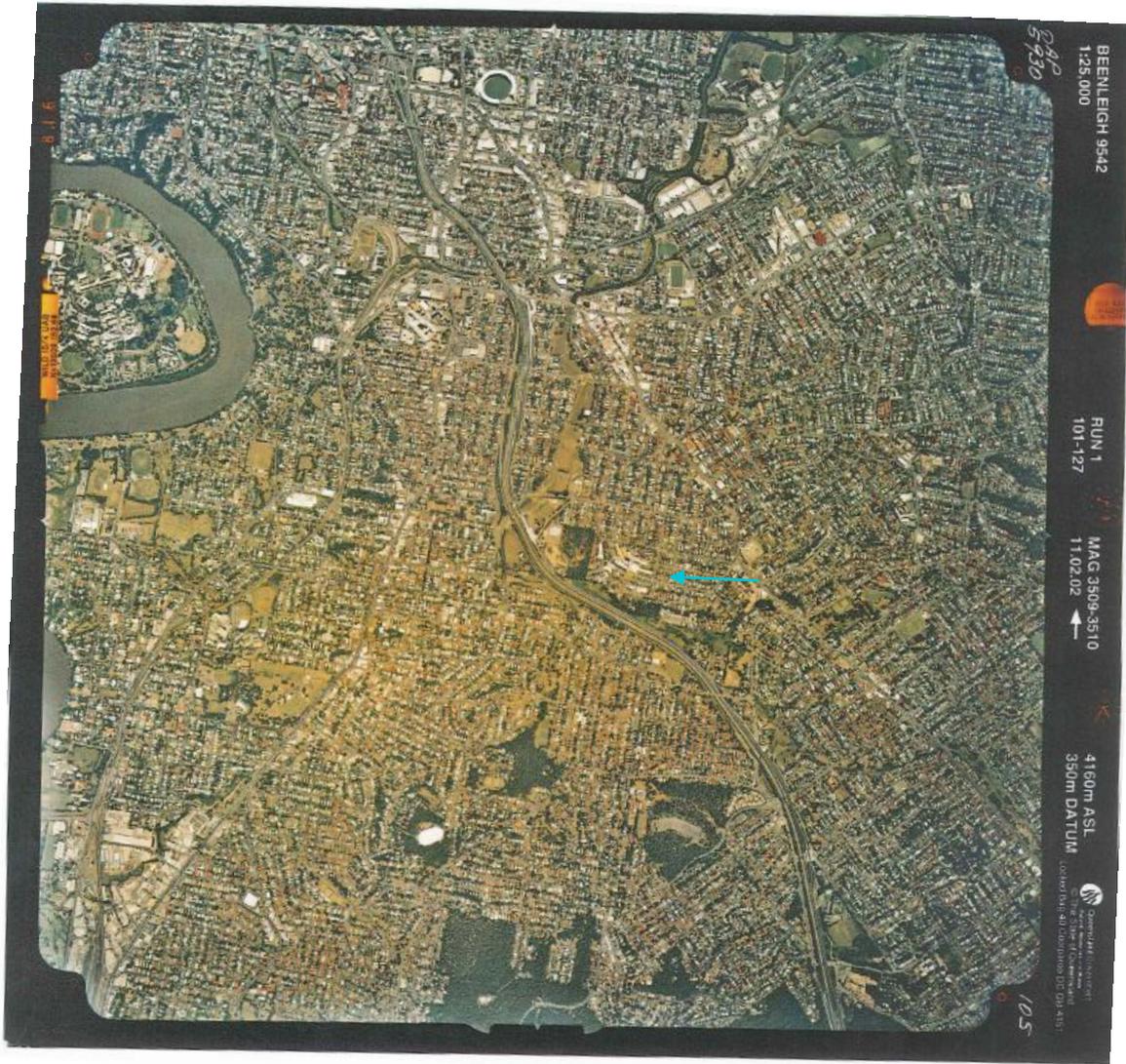
Aerial Photograph 1: 01/07/1978 Run 1. Frame 4044. Scale 1:25000



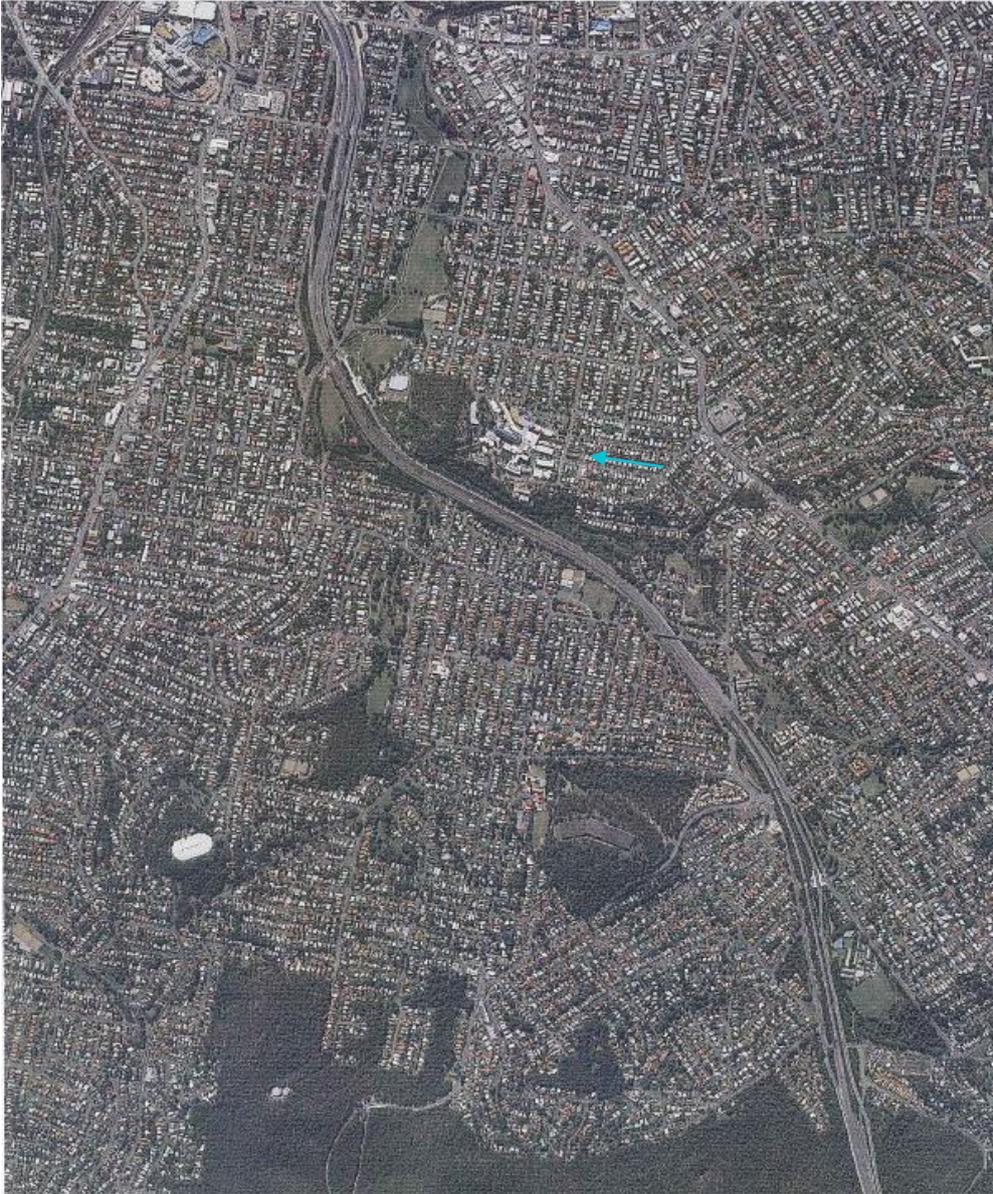
Aerial Photograph 1: 01/06/1987 Run 1. Frame 205. Scale 1:25000



Aerial Photograph 1: 28/7/1997 Run 1. Frame 20. Scale 1:25000



Aerial Photograph 1: 11/02/2002 Run 1. Frame 105. Scale 1:25000



Aerial Photograph 1: 12/06/2009 Run 10. Frame 4497. Scale 1:30000

Appendix J

Laboratory Analytical Reports

**Phase 1 Contaminated Land Assessment
114 Newdegate Street Greenslopes**

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

92997



SA: Level 1, 2-3 Greenhill Rd, Wayville SA 5034..... Tel (08) 7221 3500..... Fax (08) 8172 1968
 TAS: Coffey Business Centre, 2 Melville St, Hobart TAS 7000..... Tel (03) 6108 0100..... Fax (03) 6108 0199
 VIC: 126 Trenerry Cres, Abbotsford VIC 3067..... Tel (03) 9473 1400..... Fax (03) 9473 1450
 Level 1, 23 West Fyans St, Newtown VIC 3220..... Tel (03) 5215 4600..... Fax (03) 5224 1368
 WA: 61 Duke St, Albany WA 6330..... Tel (08) 9892 6400..... Fax (08) 9892 6444
 Suite 2, 53 Burswood Rd, Burswood WA 6100..... Tel (08) 9355 7100..... Fax (08) 9355 7111
 Unit 6/7, 31 Dunn Bay Rd, Dunsborough WA 6281..... Tel (08) 9756 9500..... Fax (08) 9756 9501

ACT: 17 Torrens St Braddon ACT 2612..... Tel (02) 6162 2622..... Fax (02) 6162 0494
 NSW: Level 1, 3 Rider Blvd, Rhodes NSW 2138..... Tel (02) 8083 1600..... Fax (02) 8765 0762
 Lot 101, 19 Warabrook Blvd, Warabrook NSW 2304..... Tel (02) 4016 2300..... Fax (02) 4016 2380
 QLD: Level 2, 12 Creek St, Brisbane QLD 4000..... Tel (07) 3002 0400..... Fax (07) 3004 0444

Project No: ER06233AA Task No: Contam Land
 Project Name: DVA Greenslopes Laboratory: MGT
 Samplers Name: Matthew Cheney Project Manager: Matthew Cheney
 Special Instructions:

Analysis Request Section

*BTEX/TPH/Pb
 METALS (Specify)
 PAHs / PHENOLS
 OCs / OPs
 Asbestos
 Lead in Paint
 BIO-TM
 BTEX/DIN/OC-OPs
 Asbestos I.D.*

Lab. No.	Sample ID	Sample Location	Sample Depth	Sample Date	Time	Matrix (Soil ... etc)	Container Type & Preservative*	T-A-T (Specify)	# of CN	POST CODE	MASS	NOTES
	SS01	5 th Building	0-50	16-7-13	10:15am	Soil	G 250ml Jar I	Stel				
	SS02	↓	0-50	↓	10:30am	↓	↓	↓				
	SS03	1 st Building	0-50	↓	11:20am	↓	↓	↓				
	SS04	Waste Storage	0-100	↓	11:30am	↓	↓	↓				

<p>RELINQUISHED BY:</p> <p>Signature: <u>Matthew Cheney</u> Date: <u>17-7-13</u> Company: <u>Coffey</u> Time:</p> <p>Signature: _____ Date: _____ Company: _____ Time: _____</p>	<p>RECEIVED BY:</p> <p>Signature: <u>[Signature]</u> Date: <u>17.7.13</u> Company: <u>EUROFINS-MGT</u> Time: <u>4PM</u></p> <p>Signature: _____ Date: _____ Company: _____ Time: _____</p>	<p>Sample Receipt Advice: (Lab Use Only)</p> <p>All Samples Received in Good Condition... <input checked="" type="checkbox"/> All Documentation is in Proper Order... <input checked="" type="checkbox"/> Samples Received Properly Chilled... <u>5.4°C</u> <input checked="" type="checkbox"/> Lab. Ref/Batch No. 386251</p>
---	---	---

* Container Type & Preservation Codes: P - Plastic, G - Solvent Washed Acid Rinsed Glass Bottle, V - Vial, N - Nitric Acid Preserved
 C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice

COWANS PRINTERS 02 9755 3545

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd QLD**

Contact name: **Matthew Chenery**
Client job number: **DVA GREENSLOPS ER06233AA**
COC number: **92997**
Turn around time: **5 Day**
Date/Time received: **Jul 17, 2013 4:00 PM**
Eurofins | mgt reference: **386251**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.4 degrees Celsius.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Organic samples had Teflon liners.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Asbestos samples sent to external lab for testing.

Contact notes

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

Tammy Lakeland on Phone : (+61) (3) 8564 5000 or by e.mail:
TammyLakeland@eurofins.com.au

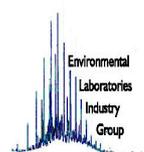
Results will be delivered electronically via e.mail to Matthew Chenery - matthew_chenery@coffey.com.

Eurofins | mgt Sample Receipt



Environmental Laboratory
Air Analysis
Water Analysis
Soil Contamination Analysis
NATA Accreditation
Stack Emission Sampling & Analysis
Trade Waste Sampling & Analysis
Groundwater Sampling & Analysis

38 Years of Environmental Analysis & Experience



Coffey Environments Pty Ltd QLD
Level 2, 12 Creek Street
Brisbane
QLD 4000

Attention: Matthew Chenery

Report 386251-S
Client Reference DVA GREENSLOPS ER06233AA
Received Date Jul 17, 2013

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 20794

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

Client Sample ID			SS01	SS02	SS03	SS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B13-JI12647	B13-JI12648	B13-JI12649	B13-JI12650
Date Sampled			Jul 16, 2013	Jul 16, 2013	Jul 16, 2013	Jul 16, 2013
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	160
TRH C29-C36	50	mg/kg	< 50	63	56	130
TRH C10-36 (Total)	50	mg/kg	< 50	63	56	290
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
Fluorobenzene (surr.)	1	%	84	63	84	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	260
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS01	SS02	SS03	SS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B13-JI12647	B13-JI12648	B13-JI12649	B13-JI12650
Date Sampled			Jul 16, 2013	Jul 16, 2013	Jul 16, 2013	Jul 16, 2013
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ	0.5	mg/kg	0.6	0.6	0.6	0.6
2-Fluorobiphenyl (surr.)	1	%	109	101	90	100
p-Terphenyl-d14 (surr.)	1	%	118	112	98	112
Organochlorine Pesticides						
4,4'-DDD	0.05	mg/kg	1.7	< 0.05	< 0.05	< 0.05
4,4'-DDE	0.05	mg/kg	1.3	< 0.05	0.09	< 0.05
4,4'-DDT	0.05	mg/kg	3.7	0.12	0.13	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	0.11	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Chlordane	0.1	mg/kg	0.9	20	0.3	8.2
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	0.07	0.20	1.7	1.1
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	0.07	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	0.26	< 0.05	0.24
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchloroendate (surr.)	1	%	128	127	82	71
Tetrachloro-m-xylene (surr.)	1	%	119	122	140	91
Organophosphorous Pesticides						
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl azinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Naled	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			SS01	SS02	SS03	SS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B13-JI12647	B13-JI12648	B13-JI12649	B13-JI12650
Date Sampled			Jul 16, 2013	Jul 16, 2013	Jul 16, 2013	Jul 16, 2013
Test/Reference	LOR	Unit				
Organophosphorous Pesticides						
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	78	107	89	78
Heavy Metals						
Arsenic	2	mg/kg	32	10	16	10
Cadmium	0.4	mg/kg	0.7	1.4	0.4	0.6
Chromium	5	mg/kg	54	12	42	22
Copper	5	mg/kg	21	27	20	33
Lead	5	mg/kg	39	100	75	72
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	35	8.4	18	11
Zinc	5	mg/kg	760	2000	190	250
% Moisture						
% Moisture	0.1	%	9.6	55	4.9	46
Asbestos			See Attached	See Attached	See Attached	See Attached

Sample History

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

Description	Testing Site	Extracted	Holding Time
Eurofins mgt Suite 10			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - MGT 100A	Brisbane	Jul 18, 2013	14 Day
BTEX - Method: USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons	Brisbane	Jul 18, 2013	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LM-LTM-ORG2010	Brisbane	Jul 18, 2013	14 Day
Polycyclic Aromatic Hydrocarbons - Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons	Brisbane	Jul 18, 2013	14 Day
Organochlorine Pesticides - Method: USEPA 8081 Organochlorine Pesticides	Melbourne	Jul 19, 2013	14 Day
Organophosphorous Pesticides - Method: USEPA 8141 Organophosphorus Pesticides	Melbourne	Jul 19, 2013	14 Day
Metals M8 - Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury	Melbourne	Jul 19, 2013	28 Day
% Moisture - Method: Method 102 - ANZECC - % Moisture	Brisbane	Jul 18, 2013	14 Day

Company Name: Coffey Environments Pty Ltd QLD Address: Level 2, 12 Creek Street Brisbane QLD 4000 Client Job No.: DVA GREENSLOPS ER06233AA	Order No.: Report #: 386251 Phone: 07 3002 0400 Fax: 07 3002 0444	Received: Jul 17, 2013 4:00 PM Due: Jul 24, 2013 Priority: 5 Day Contact Name: Matthew Chenery
Eurofins mgt Client Manager: Tammy Lakeland		

Sample Detail					% Moisture	Asbestos	Eurofins mgt Suite 10
Laboratory where analysis is conducted							
Melbourne Laboratory - NATA Site # 1254 & 14271							X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794					X		
External Laboratory						X	
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
SS01	Jul 16, 2013	10:15AM	Soil	B13-JI12647	X	X	X
SS02	Jul 16, 2013	10:30AM	Soil	B13-JI12648	X	X	X
SS03	Jul 16, 2013	11:20AM	Soil	B13-JI12649	X	X	X
SS04	Jul 16, 2013	11:20AM	Soil	B13-JI12650	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

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

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

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

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

UNITS

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Units

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

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environment Protection Authority
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

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

Results <10 times the LOR : No Limit

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

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

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

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions TRH C6-C36 - MGT 100A						
TRH C6-C9	mg/kg	< 20		20	Pass	
TRH C10-C14	mg/kg	< 20		20	Pass	
TRH C15-C28	mg/kg	< 50		50	Pass	
TRH C29-C36	mg/kg	< 50		50	Pass	
Method Blank						
BTEX USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	< 0.1		0.1	Pass	
Toluene	mg/kg	< 0.1		0.1	Pass	
Ethylbenzene	mg/kg	< 0.1		0.1	Pass	
o-Xylene	mg/kg	< 0.1		0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2		0.2	Pass	
Xylenes - Total	mg/kg	< 0.3		0.3	Pass	
Method Blank						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010						
Naphthalene	mg/kg	< 0.5		0.5	Pass	
TRH C6-C10	mg/kg	< 20		20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20		20	Pass	
TRH >C10-C16	mg/kg	< 50		50	Pass	
TRH >C16-C34	mg/kg	< 100		100	Pass	
TRH >C34-C40	mg/kg	< 100		100	Pass	
Method Blank						
Polycyclic Aromatic Hydrocarbons USEPA 8270 Polycyclic Aromatic Hydrocarbons						
Acenaphthene	mg/kg	< 0.5		0.5	Pass	
Acenaphthylene	mg/kg	< 0.5		0.5	Pass	
Anthracene	mg/kg	< 0.5		0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5		0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5		0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5		0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Chrysene	mg/kg	< 0.5		0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5		0.5	Pass	
Fluoranthene	mg/kg	< 0.5		0.5	Pass	
Fluorene	mg/kg	< 0.5		0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5		0.5	Pass	
Naphthalene	mg/kg	< 0.5		0.5	Pass	
Phenanthrene	mg/kg	< 0.5		0.5	Pass	
Pyrene	mg/kg	< 0.5		0.5	Pass	
Method Blank						
Organochlorine Pesticides USEPA 8081 Organochlorine Pesticides						
4,4'-DDD	mg/kg	< 0.05		0.05	Pass	
4,4'-DDE	mg/kg	< 0.05		0.05	Pass	
4,4'-DDT	mg/kg	< 0.05		0.05	Pass	
a-BHC	mg/kg	< 0.05		0.05	Pass	
Aldrin	mg/kg	< 0.05		0.05	Pass	
b-BHC	mg/kg	< 0.05		0.05	Pass	
Chlordane	mg/kg	< 0.1		0.1	Pass	
d-BHC	mg/kg	< 0.05		0.05	Pass	
Dieldrin	mg/kg	< 0.05		0.05	Pass	
Endosulfan I	mg/kg	< 0.05		0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Organophosphorous Pesticides USEPA 8141 Organophosphorus Pesticides							
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl azinphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Naled	mg/kg	< 0.5			0.5	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Metals M8 USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions TRH C6-C36 - MGT 100A							
TRH C6-C9	%	87			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons							
Benzene	%	84			70-130	Pass	
Toluene	%	79			70-130	Pass	
Ethylbenzene	%	80			70-130	Pass	
m&p-Xylenes	%	79			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010							
TRH C6-C10	%	85			70-130	Pass	
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons USEPA 8270 Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	102			70-130	Pass	
Anthracene	%	111			70-130	Pass	
Benz(a)anthracene	%	104			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	%	96			70-130	Pass	
Benzo(g,h,i)perylene	%	104			70-130	Pass	
Benzo(k)fluoranthene	%	114			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a,h)anthracene	%	96			70-130	Pass	
Fluoranthene	%	102			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	100			70-130	Pass	
Naphthalene	%	97			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	99			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides USEPA 8081 Organochlorine Pesticides							
4,4'-DDD	%	116			70-130	Pass	
4,4'-DDE	%	127			70-130	Pass	
4,4'-DDT	%	71			70-130	Pass	
a-BHC	%	99			70-130	Pass	
Aldrin	%	95			70-130	Pass	
b-BHC	%	126			70-130	Pass	
d-BHC	%	102			70-130	Pass	
Dieldrin	%	86			70-130	Pass	
Endosulfan I	%	93			70-130	Pass	
Endosulfan II	%	84			70-130	Pass	
Endosulfan sulphate	%	78			70-130	Pass	
Endrin	%	78			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	72			70-130	Pass	
g-BHC (Lindane)	%	97			70-130	Pass	
Heptachlor	%	81			70-130	Pass	
Heptachlor epoxide	%	92			70-130	Pass	
Hexachlorobenzene	%	126			70-130	Pass	
Methoxychlor	%	100			70-130	Pass	
LCS - % Recovery							
Organophosphorous Pesticides USEPA 8141 Organophosphorous Pesticides							
Diazinon	%	102			70-130	Pass	
Ethion	%	114			70-130	Pass	
Fenitrothion	%	97			70-130	Pass	
Methyl parathion	%	79			70-130	Pass	
Mevinphos	%	103			70-130	Pass	
LCS - % Recovery							
Metals M8 USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury							

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic				%	104			80-120	Pass	
Cadmium				%	102			80-120	Pass	
Chromium				%	107			80-120	Pass	
Copper				%	102			80-120	Pass	
Lead				%	108			80-120	Pass	
Mercury				%	87			70-130	Pass	
Nickel				%	106			80-120	Pass	
Zinc				%	102			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	B13-JI11213	NCP	%	77				70-130	Pass	
TRH C10-C14	B13-JI13381	NCP	%	88				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	B13-JI11213	NCP	%	80				70-130	Pass	
Toluene	B13-JI11213	NCP	%	76				70-130	Pass	
Ethylbenzene	B13-JI11213	NCP	%	77				70-130	Pass	
o-Xylene	B13-JI11213	NCP	%	76				70-130	Pass	
m&p-Xylenes	B13-JI11213	NCP	%	75				70-130	Pass	
Xylenes - Total	B13-JI11213	NCP	%	76				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH C6-C10	B13-JI11213	NCP	%	86				70-130	Pass	
TRH >C10-C16	B13-JI13381	NCP	%	91				70-130	Pass	
Spike - % Recovery										
Polycyclic Aromatic Hydrocarbons					Result 1					
Acenaphthene	B13-JI13381	NCP	%	84				70-130	Pass	
Acenaphthylene	B13-JI13381	NCP	%	86				70-130	Pass	
Anthracene	B13-JI13381	NCP	%	94				70-130	Pass	
Benz(a)anthracene	B13-JI13381	NCP	%	87				70-130	Pass	
Benzo(a)pyrene	B13-JI13381	NCP	%	85				70-130	Pass	
Benzo(b&j)fluoranthene	B13-JI13381	NCP	%	85				70-130	Pass	
Benzo(g,h,i)perylene	B13-JI13381	NCP	%	84				70-130	Pass	
Benzo(k)fluoranthene	B13-JI13381	NCP	%	87				70-130	Pass	
Chrysene	B13-JI13381	NCP	%	83				70-130	Pass	
Dibenz(a,h)anthracene	B13-JI13381	NCP	%	80				70-130	Pass	
Fluoranthene	B13-JI13381	NCP	%	84				70-130	Pass	
Fluorene	B13-JI13381	NCP	%	83				70-130	Pass	
Indeno(1,2,3-cd)pyrene	B13-JI13381	NCP	%	83				70-130	Pass	
Naphthalene	B13-JI13381	NCP	%	85				70-130	Pass	
Phenanthrene	B13-JI13381	NCP	%	83				70-130	Pass	
Pyrene	B13-JI13381	NCP	%	82				70-130	Pass	
Spike - % Recovery										
Organochlorine Pesticides					Result 1					
4,4'-DDD	M13-JI14451	NCP	%	102				70-130	Pass	
4,4'-DDE	M13-JI14451	NCP	%	116				70-130	Pass	
4,4'-DDT	M13-JI14451	NCP	%	77				70-130	Pass	
a-BHC	M13-JI14312	NCP	%	111				70-130	Pass	
Aldrin	M13-JI14312	NCP	%	105				70-130	Pass	
b-BHC	M13-JI14312	NCP	%	127				70-130	Pass	
d-BHC	M13-JI14312	NCP	%	125				70-130	Pass	
Dieldrin	M13-JI14312	NCP	%	113				70-130	Pass	
Endosulfan I	M13-JI14312	NCP	%	121				70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	M13-JI14312	NCP	%	104			70-130	Pass	
Endosulfan sulphate	M13-JI14312	NCP	%	109			70-130	Pass	
Endrin	M13-JI14312	NCP	%	95			70-130	Pass	
Endrin aldehyde	M13-JI14312	NCP	%	93			70-130	Pass	
Endrin ketone	M13-JI14312	NCP	%	100			70-130	Pass	
g-BHC (Lindane)	M13-JI14312	NCP	%	123			70-130	Pass	
Heptachlor	M13-JI14312	NCP	%	116			70-130	Pass	
Heptachlor epoxide	M13-JI14312	NCP	%	123			70-130	Pass	
Hexachlorobenzene	M13-JI14312	NCP	%	124			70-130	Pass	
Methoxychlor	M13-JI14312	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Organophosphorous Pesticides				Result 1					
Diazinon	B13-JI12647	CP	%	124			70-130	Pass	
Ethion	B13-JI12647	CP	%	130			70-130	Pass	
Fenitrothion	B13-JI12647	CP	%	88			70-130	Pass	
Methyl parathion	B13-JI12647	CP	%	70			70-130	Pass	
Mevinphos	B13-JI12647	CP	%	103			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	M13-JI13776	NCP	%	103			75-125	Pass	
Cadmium	B13-JI13030	NCP	%	75			75-125	Pass	
Chromium	B13-JI13030	NCP	%	77			75-125	Pass	
Copper	B13-JI13030	NCP	%	102			75-125	Pass	
Lead	B13-JI13030	NCP	%	82			75-125	Pass	
Mercury	B13-JI14126	NCP	%	90			70-130	Pass	
Nickel	B13-JI13030	NCP	%	75			75-125	Pass	
Zinc	M13-JI13475	NCP	%	86			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B13-JI11213	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B13-JI13381	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B13-JI13381	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B13-JI13381	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B13-JI11213	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B13-JI11213	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B13-JI11213	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
o-Xylene	B13-JI11213	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B13-JI11213	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Xylenes - Total	B13-JI11213	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B13-JI11213	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B13-JI11213	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	B13-JI11213	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	B13-JI13381	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B13-JI13381	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B13-JI13381	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Anthracene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	B13-JI13381	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
4,4'-DDD	M13-JI14451	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	M13-JI14451	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	M13-JI14451	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chlordane	M13-JI14312	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
d-BHC	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	M13-JI14312	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	M13-JI14312	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Organophosphorous Pesticides				Result 1	Result 2	RPD		
Bolstar	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfthion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl azinphos	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass

Duplicate								
Organophosphorous Pesticides				Result 1	Result 2	RPD		
Naled	B13-JI12647	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phorate	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	B13-JI12647	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Metals M8				Result 1	Result 2	RPD		
Arsenic	M13-JI11689	NCP	mg/kg	10	9.2	13	30%	Pass
Cadmium	B13-JI13030	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	B13-JI13030	NCP	mg/kg	18	22	22	30%	Pass
Copper	B13-JI13030	NCP	mg/kg	9.8	12	19	30%	Pass
Lead	M13-JI11689	NCP	mg/kg	77	63	20	30%	Pass
Mercury	B13-JI14126	NCP	mg/kg	0.30	0.30	9.0	30%	Pass
Nickel	B13-JI13030	NCP	mg/kg	8.1	10	24	30%	Pass
Zinc	A13-JI11416	NCP	mg/kg	630	610	3.0	30%	Pass

Comments

Asbestos was analysed by LRM Global. NATA accreditation 15684. Job number 10010.000, batch number B7734.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

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

Authorised By

Tammy Lakeland	Client Services
Bryan Wilson	Senior Analyst-Metal (QLD)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Richard Corner	Senior Analyst-Organic (QLD)
Richard Corner	Senior Analyst-Volatile (QLD)
Stacey Jenkins	Senior Analyst-Organic (VIC)



Michael Wright

National Technical Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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3, Kingston Town Close
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Client Ref: 386251

Job Number: 10010.000

Batch Number: B7734

Received Date: July 18, 2013

Analysed Date: July 23, 2013

No of Samples: 4

Dear Tammy Lakeland,

This report presents the analytical results of samples forwarded by Eurofins / mgt Environmental Consulting for asbestos analysis.

Methodology:

The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining Method. (LRM Global ID Method 1) with AS9464.

Analytical Results:

Sample No.	Sample Description	Result
SS01_JL12647	The sample consisted of *fibres approximate weight = 0.029 grams, plant matter and soils. Sample weight = 440.0 grams	*Chrysotile Asbestos Detected Organic Fibre Detected
SS02_JL12648	The sample consisted of *fibres approximate weight = 0.031 grams,, plant matter and soils Sample weight = 143.0 grams	*Chrysotile Asbestos Detected Organic Fibre Detected
SS03_JL12649	The sample consisted of plant matter and soils Sample weight = 226.0 grams	#No Asbestos Detected
SS04_JL12650	The sample consisted of plant matter and soils Sample weight = 492.0 grams	#No Asbestos Detected Organic Fibre Detected

#No asbestos found at the reporting limit of 0.1 g/kg.



Approved Identifier
Karu Jayasundara



Report Issued by
Karu Jayasundara



WORLD RECOGNISED
ACCREDITATION
Accreditation No: 15684

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.