PROPOSED

"MADDINGTON ROAD PRECINCT A"

OUTLINE DEVELOPMENT PLAN

LOTS 412-414, 5-6, 125-126, 2 & 103 MADDINGTON ROAD

MADDINGTON

CITY OF GOSNELLS

burgess design group
TOWN PLANNING + URBAN DESIGN

PREPARED FOR:

Greystone Developments Pty Ltd

PREPARED BY:

Burgess Design Group

MODIFIED MARCH 2010

ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the City of Gosnells Local Planning Scheme No. 6

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

07 MARCH 2012

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Date of Expiry: **19 OCTOBER 2030**

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1.0 INTRODUCTION

Burgess Design Group has been engaged by the landowners of Lots 412-414, 5-6, 125-126, 2 & 103 Maddington Road, Maddington to prepare an Outline Development Plan (ODP) for the subject land.

An endorsed ODP is a requirement of the City of Gosnells' Town Planning Scheme No. 6 for land zoned 'Residential Development' as a precursor to its subdivision and development for urban purposes.

The Scheme sets out the matters to be addressed in ODP's. This ODP report and accompanying plan have been prepared in a manner that fully and sufficiently responds to these matters.

Further, this report confirms that the ODP reflects the policy and statutory planning requirements of both Council and the Western Australian Planning Commission. The plan is based on contemporary planning principles facilitating the creation of a sustainable, active and engaging community environment as outlined in the objectives and applications of Liveable Neighbourhoods No. 4.

2.0 SUBJECT AREA

2.1 Location

The ODP is comprised of Lots 412-414, 5-6, 125-126, 2 & 103 Maddington Road, Maddington (the subject land) and is also known as Maddington Road Precinct A. The subject land is generally bounded by Maddington Road to the north, Dellar Road to the east, Alcock Street to the west and the existing Maddington residential suburb to the south. It is located approximately 18 km south east of the Perth CBD. A Location Plan is provided at Appendix A.

2.2 Ownership

The subject land can be legally described as:

- Lot 412 Maddington Road on Diagram 3327 Vol: 1537 Fol: 593, owned by George Hatzikotsis;
- Lot 413 Maddington Road on Diagram 3327 Vol: 1665 Fol: 90, owned by Jeffrey Markoff;
- Lot 414 Maddington Road on Diagram 3327 Vol: 1537 Fol: 594, owned by Troika Strategic Pty Ltd;
- Lot 6 Maddington Road on Diagram 21547 Vol: 1659 Fol: 346, owned by Greystone Developments Pty Ltd;
- Lot 5 Maddington Road on Diagram 21547 Vol: 1654 Fol: 20, owned by Troika Strategic Pty Ltd;
- Lot 125 Maddington Road on Diagram 27922 Vol: 1145 Fol: 888, owned by Dudley John Howard;
- Lot 126 Maddington Road on Diagram 27922 Vol: 1145 Fol: 847, owned by Alfonzo, Guiseppe, Dominic & Grazia Guadgnino;
- Lot 2 Maddington Road on Diagram 9958 Vol: 1969 Fol: 435, owned by Luke Gerard and Kathleen Patricia Van Reeken; and
- Lot 103 Maddington Road on Diagram 103 Vol: 1747 Fol: 897, owned by Bradley Keith Hannam.

The subject land comprises a total area of approximately 16.93ha.

A Ownership Plan is provided at Appendix B.

2.3 Land Use

The subject land consists of various occupied and unoccupied residential houses, sheds and vacant land/pasture. The Orange Grove Aged Care Facility currently exists on Lot 413. The subject land is currently used as for various framing activities resulting storage of materials and building products and evidence of some remnant vegetation. An Orthographic image of the area is provided at Appendix C.

3.0 SITE ANALYSIS

3.1 Topography & Geology

The subject land gently slopes from 20m AHD in the east to 17m AHD in the west.

The surface geology of the subject land comprises Quaternary aged Guildford Clay and consists predominantly of brown silty and slightly sandy clay.

3.2 Hydrology and Acid Sulphate Soils

The Western Australian Planning Commission's Planning Bulletin 64 – Acid Sulphate soils indicates that there is low to no risk of acid sulphate soils occurring within 3 metres of ground level.

Bickley Brook is located within 500m of the subject land. The Department of Environment and Conservation's Swan Coastal Plain Wetlands Policy and dataset indicate that there are no natural wetlands occurring within the subject land. A Preliminary Site Investigation was undertaken which provides further detail in relation to the subject land's characteristics. This is included at Appendix D.

3.3 Heritage

The mapping viewed through the Department of Indigenous Affair's on-line enquiry system did not reveal the presence of sites of indigenous or European heritage values of significance on-site. The nature of the land and its use suggest that it is unlikely that it represents any value of this kind.

4.0 CONTEXT ANALYSIS

4.1 Land Use Context

Land to the north of Maddington Road forms part of the Davison Industrial Area, with the land fronting the subject land being zoned 'Composite Residential/Light Industry'. The land to the south of the subject land has been developed for residential purposes with a Residential density coding of R17.5. The land to the west is the Maddington Road Precinct B, which has had an ODP recently approved by the Council. The land to the east is reserved for Tonkin Highway with 'General Rural' land further east.

4.2 Schools

The Maddington neighbourhood is well served with schools. There are two primary schools – Bramfield Park, located some 500 metres west of the subject land, and East Maddington, located just east of the Maddington Village shopping centre.

There is also one middle high school (Years 8 to 10) in Maddington – Yule Brook College – which is located about 900 metres to the south east of Area A. Years 11 and 12 high school students from Maddington attend Sevenoaks Senior High School in Cannington, which is several kilometres away, but conveniently located near the Cannington railway station. This is reasonably convenient for Maddington residents as the Maddington station (which is on the same line as Cannington) is nearby, near the corner of Kelvin Road and The Crescent.

4.3 Open Space

Maddington is also well served with Public Open Space. Of most significance to the subject land is Gibbs Park, which is to the immediate west of the subject land on the opposite side of Alcock Street.

It is also noted that the drainage reserve to the immediate south of the subject land also forms a public open space function which can be further enhanced by encouraging access, surveillance and landscaping through the redevelopment of this locality.

4.4 Commercial

The subject land is located within close proximity to the Maddington Town Centre, which has been subject to an Enquiry-by-Design Workshop and Outcomes Report, as part of the revitalisation process initiated by the City of Gosnells through the Maddington-Kenwick Sustainable Communities Partnership. It is identified in the Outcomes Report that areas of higher residential density are an essential component to a sustainable city in order to encourage economic vitality, provide more choice in lifestyle, improve effectiveness of public transport and to avoid the pitfalls associated with urban sprawl. Due to the site's close proximity to the Maddington Town Centre it would be an ideal location for urban development with a mix of lower to medium density lots.

There is also a community centre in Gibbs Park. This, together with Gibbs Park itself and Bramfield Park primary school on the western side of Alcock Street; and a nearby Catholic Church on the eastern side of Alcock Street (which is to be retained) forms a low intensity community focal point. It is within this precinct that it is proposed to also create a small corner shop for the convenience of local residents and passing traffic on Alcock Street.

4.5 Transport Routes

The Maddington area is well served by bus and train. Bus routes on Alcock Street (Route 229) and Dellar Road (Routes 229 and 230) connect to the Maddington and Kenwick railway stations. One of the outcomes of the Enquiry-by-Design Workshop for the Maddington Town Centre was to achieve a more effective, attractive and integrated transit exchange at Maddington Railway Station.

5.0 PLANNING FRAMEWORK

5.1 Statutory Planning

5.1.1 Zoning

The subject land is zoned "Urban" under the Metropolitan Region Scheme. The land was previously zoned Urban Deferred however this has recently been lifted by the WAPC and gazetted. In accordance with Section 126(3b) of the Planning and Development Act 2005 the subject land is automatically rezoned from "General Rural" to "Residential Development" under the City of Gosnells Town Planning Scheme No. 6.

The objective of the "Residential Development" zone is:

To provide for the progressive and planned development of future urban areas for residential purposes and for commercial and other uses normally associated with residential development generally in accordance with an [adopted] Outline Development Plan.

A Zoning Plan is provided at Appendix E.

5.2 Strategic Planning

There are no adopted strategic plans in place which encompasses the subject land. However, the subject land forms an area known as Maddington Road Precinct B and is located to the east of Maddington Road Precinct A. An Outline Development Plan for Precinct A has recently be advertised and approved by the City. Precinct A is generally bounded by Maddington Road, Tarling Place and Alcock Street. The proposed Outline Development Plan for Precinct B represents a logical extension along Maddington Road.

6.0 THE OUTLINE DEVELOPMENT PLAN

6.1 Design Rationale

The Outline Development Plan (ODP) (refer to Appendix F) seeks to create an urban environment based a logical and permeable network of streets that combine to create a pleasant walking/cycling environment and a range of route alternatives linking well-spaced destinations through out the subject land and wider locality.

The design of the plan promotes a series of well surveyed urban spaces to promote physical activity (walking and cycling), interaction with the public realm, interpersonal communication and a strong sense of place. These factors stimulate physical activity, creativity and sense of place within urban areas. Housing variety is assured through a mix of low to medium density throughout the Outline Development Plan, with medium density laneway lots proposed in high-amenity areas surrounding open space to ensure passive surveillance.it should also be noted that ALL lots within the ODP area are located within 100 metres of POS.

The design has taken into account a number of existing factors including the aged care facility which currently operates on lot 413 and the existing lots which back onto the ODP area.

It also provides maximum surveillance over Maddington Road and Dellar Road.

Lot Pattern

The ODP is largely comprised of low density (R20 and R25) and medium density (R30 and R40) residential allotments. Lots have been orientated such that they would provide effective surveillance of (and achieve an effective relationship with) public/community areas such as the streets and local park and housing variety is assured through the provision of low and medium density.

The lot pattern is based on a modified grid with, primarily, east-west street blocks. This pattern is consistent with contemporary planning principles and facilitates a permeable/legible street layout. A range of route alternatives are presented to residents as they access to the various community destinations within the locality, being: local open space and the aged care facility.

The provision of low to medium density allows for the development of alternative housing stock that is not currently available within the area. The ODP incorporates a range of smaller lots with access via a rear laneway, therefore enabling direct surveillance onto public open space.

A pocket of R30 in the Centre of the ODP (see existing lot 5) has been provided to allow for the greatest development flexibility given the deep (42m) nature of the pocket, this will allow for either single or duplex dwellings to be created, thus further diversifying the dwelling products offered in the area. It should be noted that this pocket is located within 100m of 2 different POS areas and is thus in compliance with Liveable Neighbourhoods.

In addition to this, provision has been made for a R40 group housing site which is to be provided with 3 street frontages, therefore ensuring a further variety of housing options are provided.

Public Open Space Design

Three areas of POS have been provided which cater for both active and passive recreation. The allocation of the POS also enables landowners to develop independently of one another and it is noted that should Lot 413 not develop, sufficient POS has been provided across the other lots which are likely to be developed in the short term.

The location of the public open space areas and strategic lot design enables surveillance of the POS area, therefore providing amenity for residents. The proposed roads have also been designed along POS which provides pleasant vistas and focal points for pedestrians cyclists and motorists.

Multiple Landowners

The proposed ODP caters for multiple landowners offering the best possible design outcome. The design enables landowners to develop independently with the plan connecting well with the existing land development pattern.

Use of Cul-de- Sacs

The cul-de-sacs are a necessary component of the overall design given there is no opportunity for road connection due to the existing adjoining pattern of subdivision with primarily lots backing onto the ODP area. Servicing trucks will still be able to access the area, however 2 dwellings will be required to locate bins in an alternative location for bin collection.

6.1.1 *Future Lot Yield*

The following table provides a summary of the indicative residential yield of the ODP

	Estimated Number of lots	Potential No. of Dwellings
TOTAL	216	236

More detailed design at subdivision stage will determine the ultimate number of lots.

6.1.2 *Population*

Based on an average (Australian Bureau of Statistics) household size of 2.53, the Local Structure Plan would result in a residential population of approximately 597 people.

6.1.3 *Detailed Area Plans*

Detailed Area Plans (DAPs) will be prepared for the proposed laneway lots to ensure an appropriate built form outcome. These will be required to be prepared for and approved by the City as a condition of subdivision approval.

To ensure that an appropriate interface between the private and public domain is maintained, a DAP will also be required for the proposed R25 coded lot which directly overlooks the central Public Open Space and Drainage Reserve (contained within existing Lot 414) as well as the front loaded R30 lots which overlook The central POS . The DAP's will be required to be prepared for and approved by City as a condition of subdivision approval.

DAP's are not required for the centrally located pocket of R30 (contained within existing Lot 5) as these lots are intended to be flexible enough to respond to market conditions and provide greater flexibility of housing types. The reason for such a situation is provided herein: should a potential owner wish to develop a single house on a single lot in this pocket, or decide to purchase 2 resultant lots; and a DAP showed each lot as a duplex; then it would prejudice the development options available to the potential owner. By keeping the options open, it allows the pocket to be more flexible and open to single or grouped styles of development whilst still integrating effectively with the streetscape, and governed by the requirements of the R-Codes. It should also be noted that a subdivision application has already been lodged with the WAPC for Lots 5, 6 & 414 which shows this pocket as divided into 3 duplex potential lots all at 790m² in size.

6.2 Public Open Space

A total of 2.265 of reserved area of public open space (POS) is provided throughout the ODP area, with a range from 6105m^2 to 1.219ha. The proposed areas of POS constitutes Local/Neighbourhood Parks in accordance with Liveable Neighbourhoods 4 (LN4), with all the proposed residential lots located within 400 metres of the POS. The ODP design is also consistent with R16 of LN4, where at least three sides to the POS have direct access to a constructed road network ensuring adequate public access.

In accordance with LN 4, a schedule that details the provision of POS and confirming the LSP's compliance with POS requirements is provided.

PUBLIC OPEN SPACE SCHEDULE			
TOTAL SITE AREA	16.93ha (100%)		
POS REQUIRED	1.694ha (10%)		
Breakdown of Creditable POS areas			
12190 m²	*POS 1*	*POS 2*	*POS 3*
Total area	*1.219ha*	*6970m²*	*5660m²*
1:1 flood event area	*1350m²*	*820m²*	*730m²*
1:5 flood event area	*1400m²*	*890m²*	*780m²*
Difference	8-00 *50m²*	*70m²*	*50m²*
Creditable area	*1.084ha*	*6150m²*	*4930m²*
TOTAL CREDITABLE POS	2.1164ha (10.63%)		
POS SURPLUS	0.4234ha (0.63%)		

14.66%

2.482 ha

24820 m²

The above table demonstrates that the total POS provision represents 10.63% of the Gross Subdivisible Area.

The POS provision is calculated on the basis that 100% credit is applied to the restricted open space for drainage basins accommodating between the 1:1yr and 1:5yr storm events (inclusive), which is limited to a maximum of 2% of the overall 10% requirement, in accordance with LN 4. That is, the top water levels for the 1:1 is 0.0780ha and for the 1:5 is 0.1381ha resulting is drainage contribution of 0.0601ha forming part of the total POS provision.

The proposed areas of POS are to not only provide an adequate area for passive and active recreation, but also serve an urban water management function while still conserving some of the existing remnant vegetation.

6.3 Community Facilities

The ODP proposes to retain the existing Orange Grove Aged Care Facility on a lot of approximately 1.2ha. This enables the potential for future development in a coordinated manner throughout Precinct A. The ODP design ensures that the residents of the Aged Care Facility will have access to nearby POS and also access a safe walking environment that is well surveyed and permeable.

It is further noted that the buildings on the site have the opportunity to overlook the POS area not only providing passive surveillance, but also providing the residents of the aged care facility with a pleasant outlook.

6.4 Transport

6.4.1 Road Network and Hierarchy

The road network of the proposed amendment of the ODP is focussed upon achieving a series of local access streets in a legible and permeable grid-like pattern. Such an outcome encourages efficiency both for motor vehicles and, walking and cycling.

The majority of the roads are proposed to be constructed within a 15.4 metre road reserve width. Roads which front open space and other roads which only require servicing on one side of the road are to be constructed at a reduced width of 14 metres as permitted under Element 2 of Liveable Neighbourhoods via reduced verge widths on the un-serviced side. Rear laneways are provided at 6 metres width. These designs are consistent the requirements of Liveable Neighbourhoods No. 4.

Emphasis has been placed on maximising the potential for cycling and walking throughout the subject land. Furthermore, walking and cycling has been promoted through a highly permeable and logical local road network, which ensures effective connectivity to the proposed area of POS.

6.4.2 Bicycle and Pedestrian Network

The proposed future subdivision of the subject land would link with the designated Dual Use Path (DUP) network approved over surrounding landholdings. Emphasis has been placed on maximising the potential for cycling and walking throughout the subject land. Furthermore, walking and cycling has been promoted through a highly permeable and logical local road network, which ensures effective connectivity to the proposed areas of POS.

7.0 SERVICING

The Servicing Report has been prepared by Development Engineering Consultants and is provided at Appendix G. It confirms that there are no identified servicing constraints and the site is able to be serviced with all essential services. A summary of the report is provided below.

7.1 Water

The subject land can be adequately supplied with water by linking with the existing residential system to the south and an industrial development to the north of the subject land.

7.2 Sewer

The subject land is capable of being adequately supplied with reticulated sewers (under their current planning) by extending the existing deep sewer line in the rear of Pt. Lot 412 eastwards along the rear of adjoining Lot 413 into Lot 414.

7.3 Power Supply

Power is available from several locations around the site - via an existing aerial supply in Maddington Road and an underground power supply would be installed through the estate to link directly in to the existing Coorain Street underground power network (at the rear of Lot 5). It is anticipated that the estate will require transformer &/or switch gear sites to be provided at suitable locations within the proposed development.

7.4 Telecommunications

Telstra services exist in the area and there is sufficient capacity in the existing infrastructure.

7.5 Alinta Gas

Alinta Gas services are available within the area and there is sufficient capacity in the existing infrastructure.

7.6 Stormwater Drainage

A Local Water Management Strategy (LWMS) has been prepared in accordance with the Department of Water's requirements to further outline the proposed management of water across the site. This will include drainage amongst the other management measures for other water on the site. The LWMS will be submitted separately from this report.

All intercepted storm water flows generated from each of the five defined catchments will be directed into suitably sized compensating basins/swales after pre-treatment occurs via a suitable treatment train/bio-retention swales.

Compensated lows from the eastern three of the five catchments will be directed into the existing Coorain Street drainage system. Compensated flows from the western catchment will be directed into the existing culvert under Dellar Road and those from the central catchment will be directed into the existing Eva Street drainage system.

All compensating basins/swales will be designed to manage all storm events up to and including the 1 in 100 year event and outflows will be controlled to ensure that post-development discharge rates match the estimated pre-development flow rates.

Drainage has also been provided off Dellar road on one of the structure plan connection roads. It is intended that this drainage strip be landscaped providing a pleasant vista entry into the subdivision.

8.0 CONCLUSION

The information contained within this report confirms that the proposed ODP will result in an appropriate outcome consistent with the orderly and proper planning of the area. The design of the amendment to the ODP has been based on sustainable and contemporary planning principles, with emphasis on increasing the potential for additional affordable housing product within the locality.

The design also takes into consideration the existing pattern of development and existing facilities such as the aged care facility.

The ODP design also enables landowners to progress in a staged manner, namely lot 414, 5 and 6 (single ownership) has the opportunity to commence development whilst not affecting other land owners and sufficient POS has been provided in this regard.

The ODP provides a variety of housing choice, which is something that is not readily available in the area.

The design is based on contemporary planning principles facilitating the creation of a sustainable community environment, while reflecting the current policies and statutory planning requirements of both City of Gosnells and the Western Australian Planning Commission.

APPENDIX A
LOCATION PLAN

burgess design group

LEGEND:

Subject Land.....

SOURCE: landgate on-line mapping

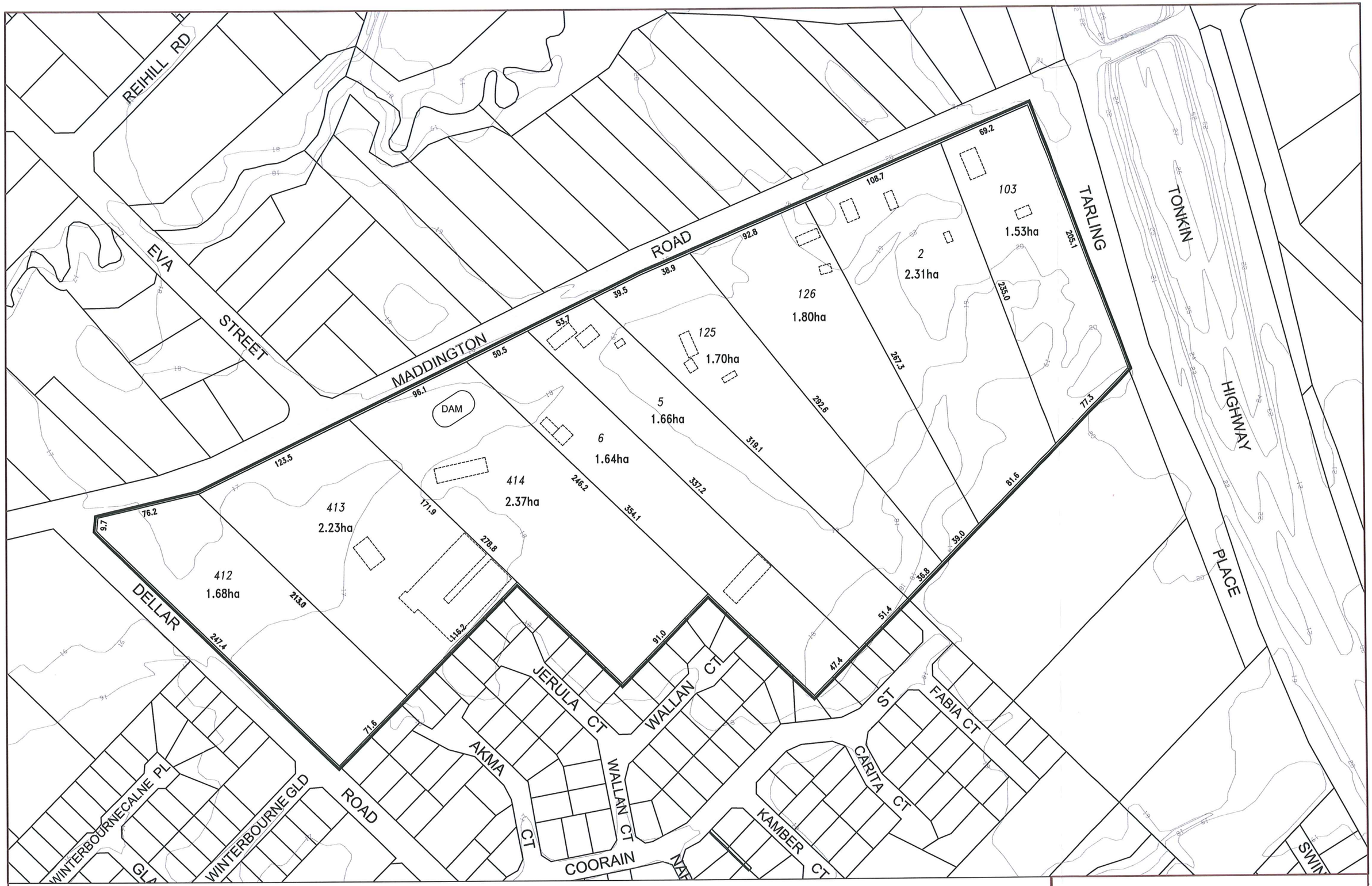
NORTH

LOCATION PLAN

MADDINGTON ROAD,
MADDINGTON

Scale: NTS Dwg No: GRE MAD-9-01 Date: 26.02.2009

APPENDIX B
LAND USE PLAN



0 20 40 60 80 100m

LEGEND:

Subject Land

Existing Buildings

NORTH

GREYSTONE DEV PTY LTD : CLIENT
1:2500 @ A3 : SCALE
09.02.2010 : DATE
GRE MAD-4-01 : DWG No

LAND USE PLAN

LOTS 412 - 414, 5 - 6, 125 - 126, 2 & 103
MADINGTON ROAD
MADDINGTON - City Of Gosnells

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APPENDIX C
AERIAL PHOTO

0 20 40 60 80 100m

LEGEND:

Subject Land.....

NORTH

GREYSTONE DEV PTY LTD : CLIENT
1:2500 @ A3 : SCALE
26.02.2009 : DATE
GRE MAD-9-02 : DWG No

ORTHO PHOTO PLAN

LOTS 5, 6, & 144 MADINGTON ROAD
MADDINGTON - City Of Gosnells

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APPENDIX D

PRELIMINARY SITE INVESTIGATION

BGE PTY LTD

LOTS 5, 6 AND 414 MADDINGTON ROAD MADDINGTON

WESTERN AUSTRALIA

PRELIMINARY SITE INVESTIGATION

JULY 2007
Ref: J06061

FOR
GREYSTONES DEVELOPMENT PTY LTD

Brown Geotechnical & Environmental Pty Ltd
Suite 4, 47 Monash Ave
Como WA 6152
Tel (08) 9368 2615

CONDITIONS RELATING TO THIS REPORT

1. This report has been prepared for the sole use of Greystones Development Pty Ltd. It has been issued in accordance with the agreed terms and scope detailed in the proposal for the investigation. No responsibility or liability to any third party is accepted for any damages arising out of the use of this report.

2. This report has been prepared by suitably qualified and experienced personnel for the purposes stated herein. Every care is taken with the report as it relates to interpretation of sub-surface conditions, discussion of findings and recommendations given. No responsibility for the consequences of extrapolation by others is accepted by the company.

3. Findings and conclusions produced in the report are based on the investigation of the sub-surface through isolated locations. Conditions between investigated sites are based on extrapolation, interpretation and professional estimates. Unexpected variations in ground conditions often occur which cannot always be anticipated. The conclusions and recommendations in the report were considered accurate at the time of issue and based on certain assumptions at the time. Conditions and assumptions change with time and may affect the accuracy of the report.

4. Certain content within this report is based on information provided by the client and/or other parties and the accuracy of this information cannot be guaranteed.

5. These conditions must be read as part of the report and must be reproduced with all future copies.

6. The recommendations of this report should be considered a starting point. Recommendations should be continuously reviewed during the earthworks stage as sub-surface information and results from monitoring become available. It is strongly recommended that the Company be retained to provide consultancy and/or inspections during the earthwork stages.

INVESTIGATION SUMMARY

In November 2006, Brown Geotechnical and Environmental Pty Limited (BGE) was commissioned by Greystones Development Pty Limited to undertake a Preliminary Site Investigation (PSI) of Lots 5, 6 and 414 Maddington Road, Maddington, Western Australia (the site).

The project objective was to provide Greystones Development with the results of the desktop study including a groundwater investigation enabling them to determine whether a Detailed Site Investigation (DSI) and/or remediation and validation of the site is required.

As detailed in BGE's proposal dated 3 November 2006, the following scope of work was undertaken:

- Site inspection
- Collection and review of historical information
- Assessment of the potential contamination status of the site
- Provide recommendations for any further investigations if potentially contaminating activities are identified.
- Preparation of a Preliminary Site Investigation report suitable for review by the Department of Environment and Conservation.

Within the limitation of the scope of works, BGE has concluded that:

- The PSI established turkeys in sheds and potential past cultivation (ie. hobby farming) on Lots 5 and 6, respectively and miscellaneous rubbish on Lot 414 including batteries, oil drums, car parts and asbestos roofing as being the only potentially contaminating activities previously undertaken within the site.

- Lead concentrations in MB01, MB02 and MB03 and nickel concentrations in MB01 exceeded the Drinking Water Guidelines.

- Arsenic, mercury, zinc, copper, chromium, cadmium and OC/OPs were either reported at below the laboratory detection limits or at concentrations less than the Drinking Water Guidelines for all water samples.

Based on the information available and within the limitations of the scope of works, the site is not suitable for residential development until the soil on Lot 5 where the turkey shed is located and on Lot 6 where cultivation has occurred is investigated and the miscellaneous rubbish on Lot 414 removed and the soil beneath the rubbish investigated to ensure no

contamination has occurred. BGE recommend that a Detailed Site Investigation of Lots 5, 6 and 414 be undertaken that addresses the above potentially contaminating activities.

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1 Introduction

In September 2006, Brown Geotechnical and Environmental Pty Limited (BGE) was commissioned by Greystones Development Pty Limited to undertake a Preliminary Site Investigation (PSI) of Lots 5, 6 and 414 Maddington Road, Maddington, Western Australia (the site).

A site locality map is presented in **Figure 1** and a detailed site layout map is presented in **Figure 2**. A Western Australian Department of Environment and Conservation (DEC) Site Summary Form and the current Certificate of Titles are included in **Appendices A** and **B**, respectively. Currently, there are no Western Australian Planning Commission (WAPC) conditions available for this site as the client has not yet made an application.

This report summarises the findings of the PSI conducted at the site on 10 and 20 February and 5 April 2007 to provide an assessment of the human health and environmental risks associated with the site from past and current activities.

Objectives

The objective of the scope of work was to provide Greystones Development with the results of the desktop study including a groundwater investigation enabling them to determine whether a Detailed Site Investigation (DSI) and/or remediation and validation of the site is required.

Scope of Work

As detailed in BGE's proposal dated 3 November 2006, the following scope of works was undertaken:

- Site inspection
- Collection and review of historical information
- Assessment of the potential contamination status of the site
- Provide recommendations for any further investigations if potentially contaminating activities are identified.
- Preparation of a Preliminary Site Investigation report suitable for review by the Department of Environment and Conservation.

2 Methodology

A PSI was undertaken to identify past and present potentially contaminating land use and to determine whether a detailed soil sampling program is required. The following activities were undertaken as part of the PSI:

- Site inspection encompassing interviews with available personnel, identifying neighbouring land use and a site walkover by qualified BGE personnel
- Review of current and historical aerial photography from the Department of Land Information (DOLI)
- Review of current and historical Certificates of Title from Department of Land Information (DOLI)
- Determine likely groundwater elevations and quality near the site including a search of DEC AQWA database bore data
- Review of geological data to determine the topography and geology of the area
- Review of the City of Gosnells Planning, Health and Environment Departmental records.
- Review of the WAPC Planning Bulletin 64 to determine ASS classification.
- Installation of 3 groundwater monitoring bores to depths of approximately 5 to 7 metres below ground level enabling the bores to be screened from above the watertable to the end of the hole.
- Collection of one groundwater sample from each well and measurement of groundwater level, field pH, conductivity and dissolved oxygen one week after installation.
- Laboratory analysis of 4 groundwater samples (including 1 QA/QC sample) by a NATA accredited laboratory for low level OC/OPs and heavy metals (As, Cd, Hg, Cu, Cr, Ni, Pb and Zn).
- Preparation of a report detailing the results of the PSI investigation.

3 Site Description

Lots 5, 6 and 414 Maddington Road are located on the southern side of Maddington Road and are adjoining. Lot 414 is situated to the west and Lot 5 to the east. Lots 5, 6 and 414 are 1.6491 ha, 1.6390 ha and 2.3725 ha in size respectively. The site consists of occupied and unoccupied residential houses, sheds and vacant land/pasture.

Lot 5 had an old house that is currently occupied and some geese and turkeys that roam free and also are kept in sheds. Lot 6 had evidence of past cultivation at the rear and there were piles of gravel and sand around the yard. Lot 414 consisted of a vacant house and scrub with some trees and piles of rubbish including oil drums, batteries, wire netting, car parts, an oven, bricks and old roofing (which looked like it could be asbestos) were observed during the site inspection.

Site photographs taken during the site inspection on 5 April 2007 are included in **Appendix C**.

3.1 Site Identification

Table 3.1 Summary of General Site Identification Information

Site Address:	Lots 5, 6 and 414 Maddington Road, Maddington, WA 6109
Site Name:	Lots 5, 6 and 414
Title Identification Details:	Lots 5 on Diagram 21547, Volume: 1654, Folio: 20 Lot 6 on Diagram 21547 Volume: 1659 Folio: 346 Lot 414 on Plan 3327, Volume: 1537, Folio: 594, Proprietors: Thi Loan Kim, Thanh Ngoc Kim, Michelle Phan. Greystones Development Pty Limited. And Van Minh Chung, Quoc Tan Phan, Chi Dung Nguyen.
Co-ordinates (GDA 94):	32.042124 E, 116.007094 N
Current Site Use:	Residential/vacant land
Zoning:	Properties zoned General Rural under the City of Gosnells District Planning
Proposed Site Use:	Residential subdivision

3.2 Neighbouring Land Use

Land use in the vicinity of the site includes:

North: Residential dwellings

East: Vacant Lots/Rural Land with some residential dwellings and stockpiles of dirt and gravel.

South: Residential dwellings/subdivision

West: Orange Grove Age Care Centre and residential dwellings/subdivision

No point sources of contamination (e.g. fuel service stations) that could potentially impact the site were identified immediately surrounding the site during the site inspection.

4 Site History

4.1 Council or Local Government Records

The City of Gosnells has no records of Lots 5, 6 and 414, pertaining to any illegal landfill including buried waste or applications for installation of fuel tanks. Their letter is included in **Appendix D.**

4.2 Freedom of Information Searches

Department of Environment and Conservation

The Department of Environment and Conservation stated that it has no documents relating to any kind of contaminated sites records for these properties (ie. Lots 5, 6 and 414).

Department of Water

The Department of Water conducted a thorough search and confirmed the following:

- No documents relating to any of the lots were located.
- There are no existing groundwater licences applicable to the site. The Lots are located within a proclaimed groundwater area and groundwater take would require a licence.

Department of Consumer and Employment Protection

A search of the Department of Consumer and Employment Protection records failed to locate any documentation containing information relating to dangerous goods storage at the site.

4.3 Search of Contaminated Sites Registry

The site is not listed on the WA Department of Environment and Conservation site register. However, the register is being developed and is incomplete (DEC, 2005 – formerly known as DoE).

Records obtained from the Department of Environment and Conservation, Department of Water and Department of Consumer and Employment (formerly Department of Industry and Resources) under the FOI Act are included in **Appendix E.**

4.4 Historical Aerial Photography Review

Historical aerial photos are shown in **Appendix F** and summarised in **Table 4.1.**

Table 4.1 Aerial Photography Review

Date	Observation
17/12/2005 B&W	**Lot 5** **Site** ▪ Cleared, scattered vegetation with residential development at north end of property **Surrounds** ▪ Neighbouring east property cleared, with residential development toward middle of property

	▪ Neighbouring west property cleared with residential development toward north and south of property. ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 6** **Site** ▪ Cleared, scattered vegetation and subdivided into two lots. Residential development showing on both north and south properties **Surrounds** ▪ Neighbouring east property cleared, with scattered vegetation and residential development at north end of property ▪ Neighbouring west property partially cleared with vegetation on boundaries and toward middle of property. Residential development toward north of property. ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 414** **Site** ▪ Cleared, scattered vegetation with residential development at north end of property. Thick vegetation on surrounding residential housing **Surrounds** ▪ Neighbouring west property cleared and showing both commercial development mid property and residential development on west and south boundaries ▪ Neighbouring south property cleared and showing residential development ▪ Neighbouring east property cleared and showing residential development toward north and south of property ▪ Neighbouring north property cleared and developed ▪ Visible boundaries surrounding with main road on north boundary.
7/01/1997 – B&W	**Lot 5** **Site** ▪ Cleared, scattered vegetation with residential development at north end of property **Surrounds** ▪ Neighbouring east property cleared, with residential development toward middle of property ▪ Neighbouring west property cleared with residential development toward north and south of property. ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 6** **Site** ▪ Cleared, scattered vegetation and subdivided into two lots. Residential development showing on both north and south properties **Surrounds** ▪ Neighbouring east property cleared, with scattered vegetation and residential development at north end of property ▪ Neighbouring west property partially cleared with vegetation on boundaries and toward middle of property. Residential development toward north of property. ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 414** **Site** ▪ Cleared, scattered vegetation with residential development at north end of property. Thick vegetation on surrounding residential housing **Surrounds** ▪ Neighbouring west property cleared and split. Commercial development in south property and residential development in north

	property ▪ Neighbouring south property cleared and showing residential development ▪ Neighbouring east property cleared and showing residential development toward north and south of property ▪ Neighbouring north property cleared and developed ▪ Visible boundaries surrounding with main road on north boundary.
20/04/1986 – B&W	**Lot 5** **Site** ▪ Cleared, scattered vegetation with residential development at north end of property. Property showing signs of farming. **Surrounds** ▪ Neighbouring east property cleared, with residential development toward middle of property and showing signs of farming ▪ Neighbouring west property cleared with residential development toward north of property and showing signs of farming ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 6** **Site** ▪ Cleared. Residential development showing on north property and south of property showing signs of farming (animal). **Surrounds** ▪ Neighbouring east property cleared and residential development on north boundary ▪ Neighbouring west property cleared and subdivided. North property showing residential development and south property showing signs of farming ▪ Neighbouring north property cleared and developed. ▪ Visible boundaries surrounding, main road on north boundary **Lot 414** **Site** ▪ Cleared and subdivided. North property showing residential development and south property cleared and showing possible signs of farming **Surrounds** ▪ Neighbouring west property partially cleared toward the north and vegetation covering remainder ▪ Neighbouring south property cleared and showing residential development ▪ Neighbouring east property cleared and showing residential development toward north of property and signs of farming toward south of property ▪ Neighbouring north property cleared and developed ▪ Visible boundaries surrounding with main road on north boundary.
18/06/1976 – B&W	**Lot 5** **Site** ▪ Consists of both lots 5 and 6. Cleared, residential development to north of property. Large oval track visible on property. **Surrounds** ▪ Neighbouring west property cleared, with residential development to north and market gardening delineated by rows from mid-to-south of property ▪ Neighbouring east property cleared with residential development toward north of property ▪ Neighbouring north property cleared and developed ▪ Visible boundaries surrounding, main road on north boundary **Lot 6** **Site** ▪ See lot 5 above

	Surrounds ▪ See lot 5 above **<u>Lot 414</u>** **Site** ▪ Cleared, residential development at north end and most of property is vacant land **Surrounds** ▪ Neighbouring west property partially cleared toward the north and vegetation covering remainder ▪ Neighbouring south property cleared and showing market gardening delineated by rows ▪ Neighbouring east property cleared, residential development to north of property. Large oval track visible on property. ▪ Neighbouring north property cleared and showing signs of an orchard delineated by dots ▪ Visible boundaries surrounding with main road on north boundary.
13/03/1967 – B&W	Could not identify site on photograph

4.5 Historical Certificate of Title Review

A review of historical certificate of Titles identified one of the historical owners as being a hobby farmer. A table summarising the previous owners and the sub-division of the land before Lots 5, 6 and 414 existed by themselves is shown in **Appendix G**.

5 Environmental Settings

5.1 Topography

Lots 5, 6 and 414 are predominantly flat, sloping gently to the west at a height of approximately 18.5 m above Australian Height Datum (AHD) (DoW, 2007).

The site had not been cleared for development when the site inspection was undertaken.

5.2 Geology

Based on the hydrogeology and Groundwater Resources of the Perth Region Western Australia, surface geology of the site comprises Quaternary aged Guildford Clay. Underlying this unit at depth is the Albian to Cenomanian aged Kardinya Shale Member of the Osborne Formation.

The Guildford Clay is fluvial in origin and consists predominantly of brown silty and slightly sandy clay, it often contains lenses of fine to coarse grained, poorly sorted conglomeratic and may have a shelly sand at its base. The unit is known to be up to 35 m thick in places and in this area unconformably overlies the Kardinya Shale Member on an erosional surface (Davidson, 1995).

The Kardinya Shale Member of the Osbourne Formation consists of moderately to tightly consolidated, interbedded siltstones and shales. These are dark green to black, glauconitic, often puggy and include thin interbeds of fine grained sandstone. Scattered coarse grains of high sphericity are common within the siltstones and shales. Onshore it reaches a maximum thickness of approximately 140 m (Davidson, 1995).

5.3 Acid Sulphate Soils

The Quarternary clays beneath the site are not expected to contain high concentrations of acid sulphate minerals and consequently have a moderate to low risk of acid generation (http:/www.wrc.wa.gov.au/infocentre/atlas/atlas_html/, accessed 9/05/07).

5.4 Surface Hydrology

Bickley Brook is located within 500 m of the site. The next nearest water body to the site is the Swan River, which is approximately 2 km south of the site.

5.5 Hydrogeology

Water bearing layers and aquifers potentially occurring beneath the site is the superficial aquifer – Cloverdale Area, which has a maximum saturated depth of 30 m with total dissolved solids in this area ranging from 500 to >2000 mg/L. The groundwater has potential potable use and the flow direction should be to the west. Based on the depth to groundwater, the vulnerability of contamination to groundwater beneath the site is moderate.

5.6 Groundwater Resources and Beneficial Uses

Land use in the general area surrounding the site includes residential and commercial use.

A bore search identified 26 registered bores located within 1 km of the site. The recorded purpose of registered bores included livestock, garden irrigation, orchard and production use.

With respect to the use of groundwater beneath the site the Department of Health (DoH) considers it an unsafe practice to drink or swim in untreated groundwater as experience has shown the groundwater may contain microbiological and chemical contamination. Groundwater should always be tested, assessed by an experienced person and then treated appropriately to ensure that it is safe for the intended use.

Based on a TDS value of 500 to >2000 mg/L the most beneficial use of groundwater beneath the site would be for Long-Term Irrigation purposes. However, TDS values from the groundwater beneath the site ranged from 143 to 841 mg/L, which falls within the range required for drinking water.

5.7 Groundwater Quality

Groundwater quality for the site has been obtained from the groundwater investigation undertaken on the site by Brown Geotechnical and Environmental in February 2007. A summary of the findings is outlined below:

- The depth to shallow groundwater within monitoring wells across the site ranged from 3.041 to 4.741 m below top of casing. Based on gauging data, the inferred hydraulic gradient is flowing to the west and all groundwater samples were free from sheen or hydrocarbon odour.
- Measured pH values ranged from 5.99 to 7.01.
- Electrical conductivity readings ranged from 227 to 1335 mS/cm (hence approximately 143 to 841 mg/L TDS), thereby indicating that the groundwater is suitable for drinking water purposes.
- Dissolved oxygen (DO) levels ranged from 2.12 to 3.71 mg/L.

6 Methodology

6.1 Groundwater Methodology

Field activities conducted as part of the groundwater assessment program were undertaken on the 10 and 20 February 2007. Field activities are summarised in **Table 6.1** and grid references for the groundwater bores are included in **Table 6.2**. Groundwater bore logs and gauging sheets are included in **Appendices H** and **I**, respectively.

Table 6.1 Summary of Groundwater Assessment

Activity	Location	Details
Clearance of underground services	MB01 to MB03 inclusive	Service Location survey by MP Electrolocation
Well construction and installation	MB01 to MB03 inclusive	Wells were constructed with 50 mm, class 18, uPVC threaded screen and casing in accordance with BGE well construction procedures.
Well development	MB01 to MB03 inclusive	Wells were purged of 5 well volumes or until bailed dry upon completion of construction
Well gauging	MB01 to MB03 inclusive	Field measurements of pH, temperature, dissolved oxygen and EC were taken every 12 L or until the parameters stabilised.
Sampling method	MB01 to MB03 inclusive	Disposable bailers were used to obtain the groundwater samples
Decontamination procedure	MB01 to MB03 inclusive	New disposable gloves and new strings were used for each well to avoid the risk of cross contamination
Sample preservation	MB01 to MB03 inclusive	Samples were collected in laboratory supplied bottles and immediately stored in an insulated esky chilled with ice bricks upon sampling until transit to the laboratory

Table 6.2 Grid Reference of Groundwater Bores

GW Bore	Grid Reference
MB01	116.005372 E; 32.041995 S
MB02	116.006537 E; 32.040872 S
MB03	116.008248 E; 32.043191 S

7 Environmental Investigation Levels

Background groundwater quality sampling was taken from three groundwater monitoring bores installed on the site in February 2007. The location of the monitoring bores are shown in **Figure 2**, with monitoring bore logs and groundwater gauging data sheets detailed in **Appendices H and I**, respectively.

7.1 Water Assessment Criteria

Groundwater quality laboratory results are primarily assessed against the Drinking Water Guidelines and the Long Term Irrigation Guidelines have been included in the absence of the Drinking Water Guidelines. **Table 7.1** below outlines the adopted groundwater investigation levels.

7.2 Groundwater Analytical Results

Table 7.1 Groundwater Investigation Levels

Analytical Groupings	Analyte	Drinking Water (mg/L)	Long-Term Irrigation (mg/L)	Adopted Investigation Level
OC/OPs	Aldrin	0.0003	-	**0.0003**
	Dieldrin	0.0003	-	**0.0003**
	Chlordane	0.001	-	**0.001**
	DDT	0.02	-	**0.02**
	Chlorpyrifos	0.03	-	**0.03**
	Diazinon	0.003	-	**0.003**
Metals	Lead	0.01	2.0	**0.01**
	Arsenic	0.007	0.1	**0.007**
	Cadmium	0.002	0.01	**0.002**
	Chromium (Total)	-	0.1	-
	Copper	2.0	0.2	**2.0**
	Mercury (inorganic)	0.001	0.002	**0.001**
	Nickel	0.02	0.2	**0.02**
	Zinc	3.0	2.0	**3.0**

Notes:

- No investigation level available

8 Results and Discussion

8.1 Groundwater Analytical Results

The number of groundwater samples analysed, analytes tested for, minimum/maximum constituent concentrations and samples that exceeded the investigation levels are detailed in **Table 8.1**. Tables of groundwater analytical results, copies of laboratory certificates and signed chain of custody documents are included in **Appendices J** and **K**, respectively.

Table 8.1 Summary of Groundwater Analytical Results

Samples Analysed	Analyte	Min Conc. (µg/L)	Max Conc. (µg/L)	Samples Exceeding Investigation Levels
3	Aldrin	<0.010	<0.010	None
3	Dieldrin	<0.010	<0.010	None
3	Chlordane	<0.010	<0.010	None
3	DDT	<0.010	<0.010	None
3	Chlorpyrifos	<0.050	<0.050	None
3	Diazinon	<0.10	<0.10	None
3	Lead (mg/L)	0.017	0.176	MB01,MB02,MB03
3	Arsenic (mg/L)	<0.001	0.002	None
3	Cadmium (mg/L)	<0.0001	0.0008	None
3	Chromium (mg/L)	0.004	0.010	None
3	Copper (mg/L)	0.016	0.130	None
3	Mercury (mg/L)	<0.0001	0.0001	None
3	Nickel (mg/L)	0.004	0.078	MB01
3	Zinc (mg/L)	0.013	0.105	None

All OC/OPs and metals with the exception of lead in all three monitoring bores (MB01, MB02 and MB03) and nickel in MB01 were either reported at below the laboratory detection limits or at concentrations less than the Drinking Water Guidelines for all groundwater samples. The Long Term Irrigation guidelines were not exceeded for OC/OPs and metals in all three monitoring bores.

8.2 QA/QC and Analytical Data Validation

8.2.1 Field Method Validation

Field methodologies were consistent with BGE's field procedures and are summarised in **Table 8.2**.

Table 8.2 Field Method Validation

QA/QC Requirement	Yes/No	Comments
Sampling equipment properly decontaminated	Yes	None
Sample preservation following collection in the field	Yes	None
Sufficient field QA/QC samples collected	Yes	None
Samples delivered to laboratory within holding times	Yes	None
Review of field quality control (QC) sample results	Yes	None
Other anomalies	No	None

8.2.2 Analytical Data Validation

Relative percentage differences (RPD) calculations for the inter-laboratory field duplicates are shown in **Table 8.3** and analytical data validation interpretations are summarised in **Table 8.4**

Table 8.3 Relative Percentage Difference

Sample Number	QA Type	As	Aldrin	Dieldrin	Chlordane	Heptachlor
MB01	Primary	0.002	<0.010	<0.010	<0.010	<0.005
QA1	Split sample	<0.001	<0.010	<0.010	<0.010	<0.005
RDP (%)		50	na	na	na	na

Sample Number	QA Type	Hg	Cd	Cr	Pb	Zn	Cu	Ni
MB01	Primary	0.0001	0.0008	0.010	0.176	0.105	0.130	0.078
QA1	Split sample	0.0001	0.0007	0.009	0.129	0.099	0.126	0.074
RPD (%)		na	13	10	27	6	3	5

RPD Relative Percentage Difference
na Not applicable as primary and/or QC sample are less than Practical Quantitation Limits

Table 8.4 Analytical Data Validation

QA/QC Requirement	Yes/No	Comments
Holding times	Yes	None
Laboratory accreditation	Yes	None
Sample preservation methods	Yes	None
Review of laboratory quality control results	Yes	None
Required analytical detection limits met	Yes	None

It is considered that the accuracy and precision of the groundwater data, implied from the field QA/QC information available for this project are of sufficient standard and that the analytical results can be used as a basis for interpretation.

9 Conclusion

Within the limitations of the scope of works, BGE have concluded that:

- The PSI established turkeys in sheds and potential past cultivation (ie. hobby farming) on Lots 5 and 6, respectively and miscellaneous rubbish on Lot 414 including batteries, oil drums, car parts and asbestos roofing as being the only potentially contaminating activities previously undertaken within the site.
- Lead concentrations in MB01, MB02 and MB03 and nickel concentrations in MB01 exceeded the Drinking Water Guidelines.
- Arsenic, mercury, zinc, copper, chromium, cadmium and OC/OPs were either reported at below the laboratory detection limits or at concentrations less than the Drinking Water Guidelines for all water samples.

Based on the information available and within the limitations of the scope of works, the site is not suitable for residential development until the soil on Lot 5 where the turkey shed is located and on Lot 6 where cultivation has occurred is investigated and the miscellaneous rubbish on Lot 414 removed and the soil beneath the rubbish investigated to ensure no contamination has occurred. BGE recommend that a Detailed Site Investigation of Lots 5, 6 and 414 be undertaken that addresses the above potentially contaminating activities.

BROWN GEOTECHNICAL AND ENVIRONMENTAL

GINA PEMBERTON
ENVIRONMENTAL DIRECTOR

10 References

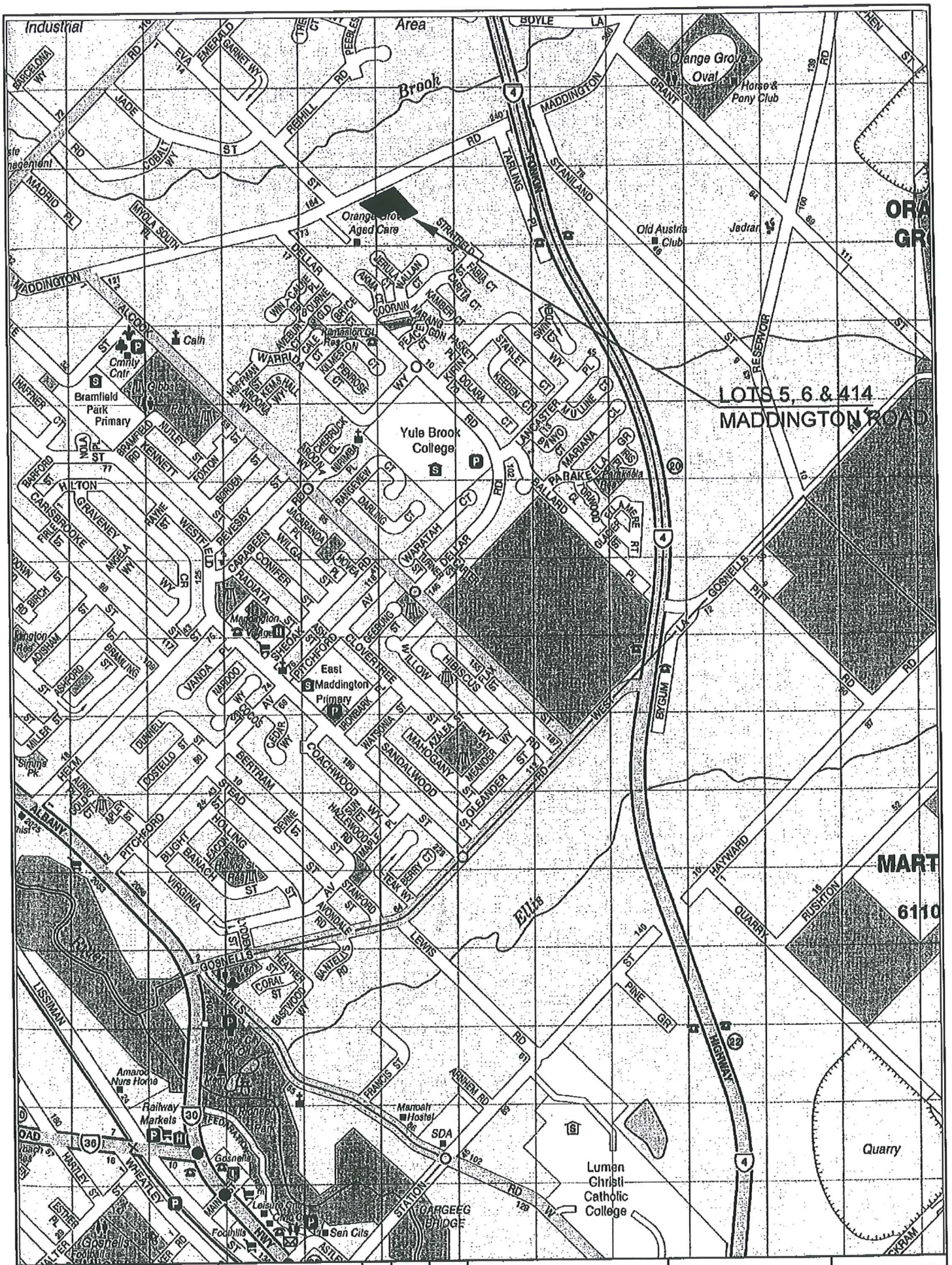
DoE and WAPC (Nov 2003). Planning Bulletin No.64. Central Metropolitan Region Scheme Acid Sulphate Soils.

Department of Water (2006): www.environmental.wa.gov.au

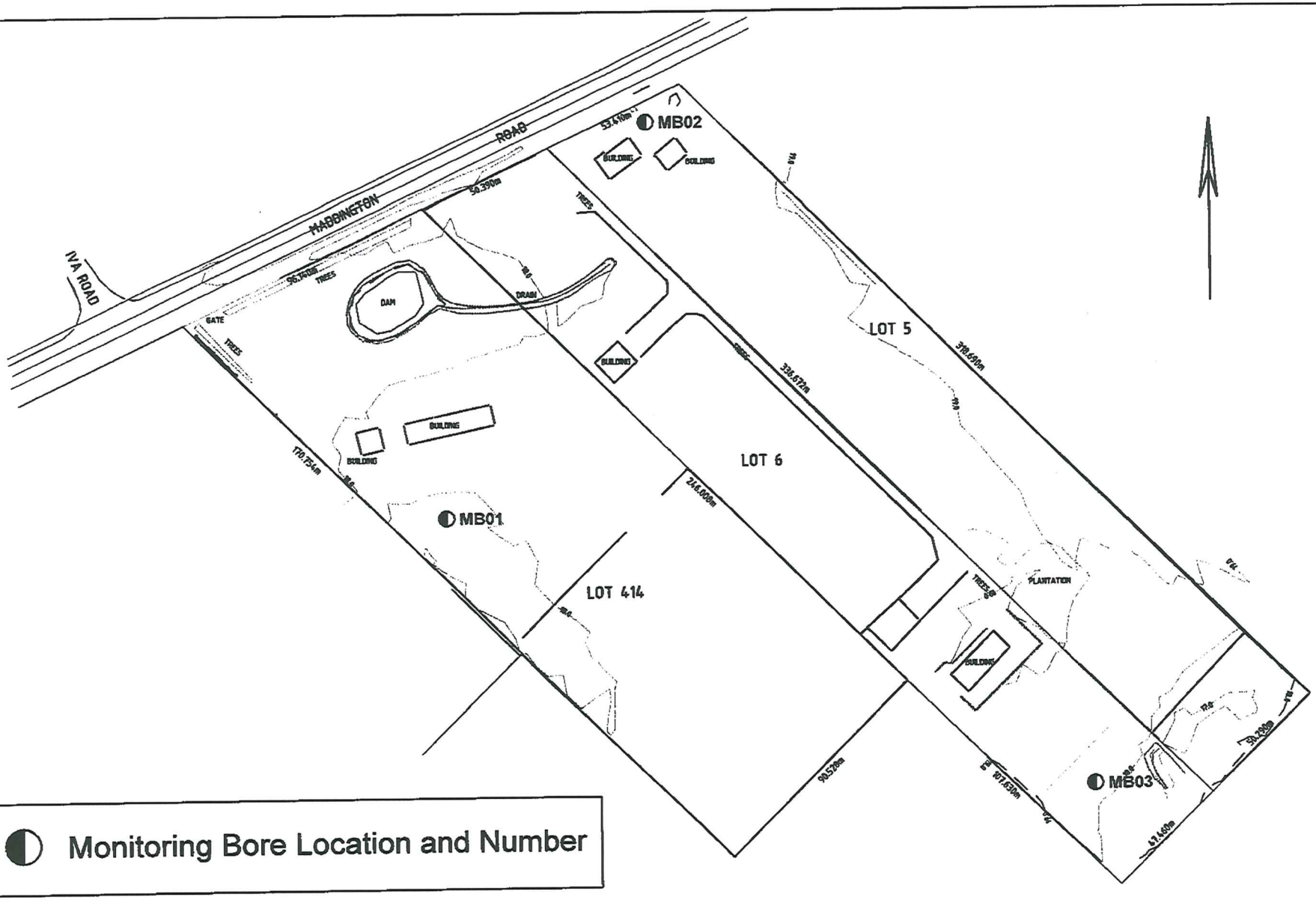
Department of Environment. December 2001. Contaminated Sites Management Series. Contaminated Sites Technical Guidelines.

Department of Environment. 2004. Perth Groundwater Atlas 2nd ed.

FIGURES



Brown Geotechnical & Environmental	Date	Description	Drawn	Checked	Approved	SITE PLAN	CLIENT	Drawing No. 06061.01
Suite 4, 47 Monash Avenue Como WA6152 Tel: (08) 9368 2615 Email: bge@acidss.com.au	14.06.07	SITE PLAN	HC	GP				Scale: NTS
						LOTS 5, 6 AND 414 MADDINGTON ROAD MADDINGTON	GREYSTONES DEVELOPMENT PTY LTD	Sheet Size: A4
								Job No. 06061.01
								FIGURE 1



Brown Geotechnical & Environmental Suite 4, 47 Monash Avenue Como WA 6152 Tel: 08 9368 2615 Email: bge@acidss.com.au	Date	Description	Drawn	Checked	Approved	SITE LAYOUT AND TEST LOCATION PLAN	CLIENT	Drawing No. 06061.01
	19.02.07	Location Plan	TW	KIB				Scale: NTS
						LOTS 5, 6 & 414 MADDINGTON ROAD MADDINGTON	GREYSTONES DEVELOPMENT PTY LTD	Sheet Size: A4
								Job No: J06061.01
								FIGURE 2

APPENDIX A

Department of Environment

Site Summary Form

For completion by person(s) submitting report(s) for assessment by the Department of Environment (DoE) as per the information requirements of the *Reporting on Site Assessments (2004)* guideline. Completion of this form assists the DoE in maintaining accurate records for the site.

Please note: A completed Site Summary Form must accompany each report submitted to the DoE for assessment. Copies of all relevant Certificates of Title must accompany this form.

Site Location Details:

Site Name (e.g. where site may be known by a common/ business name)

Lot No. 5, 6 & 414 **House No.** **Street** Maddington Road

Suburb Maddington **State** WA **Postcode** 6109

Crown Reserve (if applicable) N/A

Certificate(s) of Title (or equivalent) Lot 5 on Diagram 21547, Volume: 1654; Folio: 20, Lot 6 on Diagram 21547, Volume: 1659; Folio: 346, Lot 414 on Plan 3327, Volume: 1537; Folio: 594

Where the subject site comprises of multiple certificates of title, please list ALL certificates:.....

Where substances have migrated beyond the cadastral boundaries of the subject site, please provide the addresses, relevant Certificates of Title documentation and owners details for ALL offsite properties impacted (includes soil and/or groundwater), as an attachment to this form.

Is a hard copy of Certificate of Title and associated sketch for ALL listed sites attached? (Y/N) Yes - attached

Current Owner/Occupier Details:

Site Owner (Name and address) Thi Loan Kim, Thanh Ngoc Kim, Michelle Phan.
Greystones Development Pty Limited. And
Van Minh Chung, Quoc Tan Phan, Chi Dung Nguyen.

Site Owner Company ACN/ABN N/A

Site Occupier (Name and address) Tenants on Lot 5 and 6 only – refer Greystones Development for details.

Site Occupier Company ACN/ABN N/A

Site Status (at time of reporting):

Proposed land use (e.g. high density residential/child care facility) High density residential subdivision

Identified substances and relevant media (e.g. benzene in soil and groundwater, xylene in soil only) Lead and Nickel in the groundwater that exceeded the WA Drinking Water Guidelines. Soil was not investigated as it was a PSI with a groundwater investigation.

Asbestos (Y/N)	N	**Health Risk Assessment** (Y/N)	N	**Community health concerns identified** (Y/N)	N	**Other human health issues** (Y/N)	N
Air quality issues (Y/N)	N	**Past/Present Landfill** (Y/N)	N	**Potential human exposure to identified substances > DoE's Health Investigation Levels or equivalent** (Y/N)	N		

Specify other health issues.....

Where YES is recorded for at least one of the above categories, please submit 2 copies of the report(s) (relevant documentation) to the DoE for referral to the Department of Health.

Are site activities licensed under the *Environmental Protection Act 1986?* (Y/N) Licence No. N/A

Where laboratory analysis has been undertaken, is the laboratory NATA accredited for ALL analytes and analytical methodologies used? (Y/N) (If No, why not?) Yes

Community Consultation (as per the DoE's *Community Consultation (June 2002)* guideline)

Community consultation program commenced/proposed (Y/N) If no, why not? N/A

Are details of consultation program (e.g. Community Consultation Plan) provided in attached report (Y/N) N/A

History of Investigation:

Have previous site investigations been undertaken? (Y/N - if yes, please provide details below) No

Report title, date and author:

Declaration:

The information presented in this Site Summary Form is a true representation of the information within the attached report(s)/document(s).

Full name (print) Gina Michelle Pemberton

Position held Environmental Director – Brown Geotechnical and Environmental Pty Limited

Signature **Date** 10/07/2007

Please ensure that a hardcopy of the current Certificate(s) of Title and associated sketch accompanies the Site Summary Form. The DoE cannot proceed with the assessment of the report in the absence of this information.

DoE Registrar Only

Registrar Name: Signature:

CoT verified (Y/N) Owner details verified (Y/N) Complete Form (Y/N)

Awaiting Classification (Y/N)

Awaiting Re-Classification (Y/N)

Incomplete Form (Y/N)

LWQB Assessment Officer:

Comments/Actions:

Date of Data Entry:

APPENDIX B

26467

WESTERN AUSTRALIA

REGISTER NUMBER	
5/D21547	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
2	3/12/2005

RECORD OF CERTIFICATE OF TITLE

VOLUME 1654 FOLIO 20

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 5 ON DIAGRAM 21547

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

THI LOAN KIM
THANH NGOC KIM
AS JOINT TENANTS IN 1/2 SHARE
MICHELLE PHAN
IN 1/2 SHARE
ALL OF 19 BALLARAT WAY, DIANELLA
AS TENANTS IN COMMON

(T J515308) REGISTERED 18 NOVEMBER 2005

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. J515309 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 18.11.2005.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1654-20.
PREVIOUS TITLE: 1276-385.
PROPERTY STREET ADDRESS: 207 MADDINGTON RD, MADDINGTON.
LOCAL GOVERNMENT AREA: CITY OF GOSNELLS.

134B
Perth Batch
J948185

WESTERN AUSTRALIA

REGISTER NUMBER	
6/D21547	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
1	28/10/2006

DUPLICATE CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 1659 FOLIO 346

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 6 ON DIAGRAM 21547

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

GREYSTONES DEVELOPMENTS PTY LTD OF POST OFFICE BOX 982, BALCATTA
(T J948185) REGISTERED 11 OCTOBER 2006

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the certificate of title held in electronic form should be obtained before dealing on this land. Lot as described in the land description may be a lot or location.

----------END OF DUPLICATE CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1659-346.
PREVIOUS TITLE: 1276-385.
PROPERTY STREET ADDRESS: 201 MADDINGTON RD, MADDINGTON.
LOCAL GOVERNMENT AREA: CITY OF GOSNELLS.

26462

REGISTER NUMBER	
414/P3327	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
1	2/9/2005

WESTERN AUSTRALIA

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 1537 FOLIO 594

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 414 ON PLAN 3327

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

VAN MINH CHUNG
QUOC TAN PHAN
CHI DUNG NGUYEN
ALL OF 19 BALLARAT WAY, DIANELLA
AS TENANTS IN COMMON IN EQUAL SHARES

(T J403069) REGISTERED 22 AUGUST 2005

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. J403070 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 22.8.2005.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1537-594.
PREVIOUS TITLE: 1081-847.
PROPERTY STREET ADDRESS: 193 MADDINGTON RD, MADDINGTON.
LOCAL GOVERNMENT AREA: CITY OF GOSNELLS.

APPENDIX C

Photograph: Lot 5 Maddington Road, Maddington

Photograph: Lot 5 Maddington Road, Maddington

Photograph: Lot 6 Maddington Road, Maddington

Photograph: Lot 6 Maddington Road, Maddington

Photograph: Lot 6 Maddington Road, Maddington

Photograph: Lot 414 Maddington Road, Maddington

Photograph: Lot 414 Maddington Road, Maddington

Photograph: Lot 414 Maddington Road, Maddington

APPENDIX D

CITY OF GOSNELLS

2120 Albany Highway Gosnells WA 6110
Mail to: PO Box 662 Gosnells WA 6990

T 08 9391 3222
F 08 9398 2922

E council@gosnells.wa.gov.au
W www.gosnells.wa.gov.au
ABN 18 374 412 891

13 December 2006

Brown Geotechnical and Environmental
Unit 4, 47 Monash Avenue
COMO WA 6152

Attention: Gina Pemberton

Your Reference: J06061
Our Reference: 207714
207723
207759
Enquiries: Neil Harries
9391 3320

Dear Ms Pemberton

Request for Information - Lots 5, 6 and 414 Maddington Road, Maddington

I refer to your facsimile dated 8 December 2006 requesting information relating to a Preliminary Site Investigation for the above sites.

A search of the City's records by Health Services has revealed the following information.

Currently sewer is not available to any of the properties. As there are existing development on the properties it can be assumed that there are on site effluent disposal systems in place. Unfortunately records could only be located relating to Lot 414. A copy of the plan is attached.

The City has no record of any site contamination, illegal fill, buried waste or applications for installation of fuel tanks. This should not be construed as meaning any of these items have not taken place, merely that the City has no record of them occurring.

The City recommends a site inspection be carried out by Brown Geotechnical and Environmental as part of your due diligence auditing.

Should you have any questions or require further information please do not hesitate to contact Neil Harries on 9391 3320.

Yours sincerely

R. L. Wells

Ross Wells
MANAGER HEALTH SERVICES

Enc

APPENDIX E

Department of Environment

Your ref:

Our ref: FOI LR 299

Enquiries: Paul Hopkin

Direct tel: 08 6467 5134

Ms Gina Pemberton
Brown Geotechnical
4/47 Monash Avenue
COMO WA 6152

Dear Ms Pemberton

FREEDOM OF INFORMATION (FOI) APPLICATION – FOI LR 299
PROPERTY: LOTS 5, 6 & 414 MADDINGTON ROAD MADDINGTON

I refer to your request for access to documents concerning the above-mentioned site.

All reasonable steps have been taken to find any relevant documents and the Agency is satisfied that no documents exist on departmental files that fall within the scope of your FOI request.

If you wish to contest the decision in regard to the access of any documents, you have a right to have the decision reviewed. Details of the review process are set out in the attached extract from the Act.

Yours sincerely

Paul Hopkin
FOI ADMINISTRATOR
LEGAL SERVICES BRANCH

2 January 2007

Encl

Westralia Square
Level 8 141 St Georges Terrace
Perth Western Australia 6000
PO Box K822 Perth Western Australia 6842
Telephone (08) 9222 7000 Facsimile (08) 9322 1598
E-mail info@environment.wa.gov.au
www.environment.wa.gov.au

WESTERN AUSTRALIAN environment AWARDS

The Atrium
Level 4 168 St Georges Terrace
Perth Western Australia 6000
PO Box K822 Perth Western Australia 6842
Telephone (08) 6364 6500 Facsimile (08) 6364 6520
E-mail info@environment.wa.gov.au
www.environment.wa.gov.au

Department of Water
Government of Western Australia

FOI Ref number: DOW LR 24

FOI Coordinator: Gérard Fabien

Contact Number: 08 6364 6489

Ms Gina Pemberton
Brown Geotechnical and Environmental
4/47 Monash Avenue
COMO WA 6152

Dear Ms Pemberton

FREEDOM OF INFORMATION (FOI) APPLICATION NO: DOW LR 24
PROPERTY: LOTS 5, 6 AND 414 MADDINGTON ROAD, MADDINGTON

This letter refers to your FOI application requesting information about the above-mentioned premises.

The Department has conducted searches of relevant databases, using the description of the Properties contained in your application, and no documents have been located.

Please note there in no water licences on these Properties. They are in a proclaimed groundwater area and if you wish to take groundwater you would need to apply for a licence which would be subject to an assessment.

I also note that you are not interested in the documents from the previous Western Australian Planning Commission (WAPC) application.

If you wish to contest the decision in regard to access to the documents, you have a right to have the decision reviewed. Details of the review process are set out in the attached extract from the Act.

Yours sincerely

Gérard Fabien
FOI COORDINATOR

24 January 2007

Enc

168 St Georges Terrace Perth Western Australia 6000
PO Box K822 Perth Western Australia 6842
Telephone (08) 6364 7600 Facsimile (08) 6364 7601
www.water.wa.gov.au

Department of Consumer
and Employment Protection
Government of Western Australia

Resources Safety

Your Ref:
Our Ref: 06/07-139:RSD0222/200601
Enquiries: Ann Revell
Email: arevell@docep.wa.gov.au
Facsimile: 9325 2280

Gina Pemberton
Environmental Director
Brown Geotechnical
4/47 Monash Ave,
COMO WA 6152

Dear Gina

NOTICE OF DECISION UNDER S30 *FREEDOM OF INFORMATION ACT 1992* (the Act)

1. Your application under the Act sought access to dangerous goods storage licence documents for Lots 5, 6 and 414 Maddington Road, Maddington.

2. A search of our records has failed to locate any documentation containing the information you seek. Under s26 of the Act, the failure of the Department to locate any documents after a diligent search is deemed as a refusal to grant access.

3. Consequently, it was decided on 18 December 2006 by Melina Newnan, Acting Director Strategic Development (delegated decision maker by a general directive for the Director General as provided under s.100(1)(b) of the Act) that you may not have access to these documents as the Department has no record of any such documentation.

4. Location descriptors provided by applicants may not always match site location details stored in our database and this is why we ask applicants that if possible they provide the Dangerous Goods Storage Licence (DGS) number of the site of interest to them. However, we recognise this is not always possible and do all we reasonably can to search for the site from the information provided.

5. Please note that the lack of information held by the Department in relation to this property does not necessarily mean that the property is not or has ever been a dangerous goods storage site.

6. Accordingly, if you have any reason to suspect that the property is or may have been the subject of a dangerous goods storage licence you may need to consider carrying out additional investigations relating to your historical review of the site.

7. If you wish to contest the decision to refuse access to the documents, you have a right to have the decision reviewed. Details of the review process are set out in the attached notes.

Please do not hesitate to contact me on telephone 9222 3210 if required.

Yours sincerely

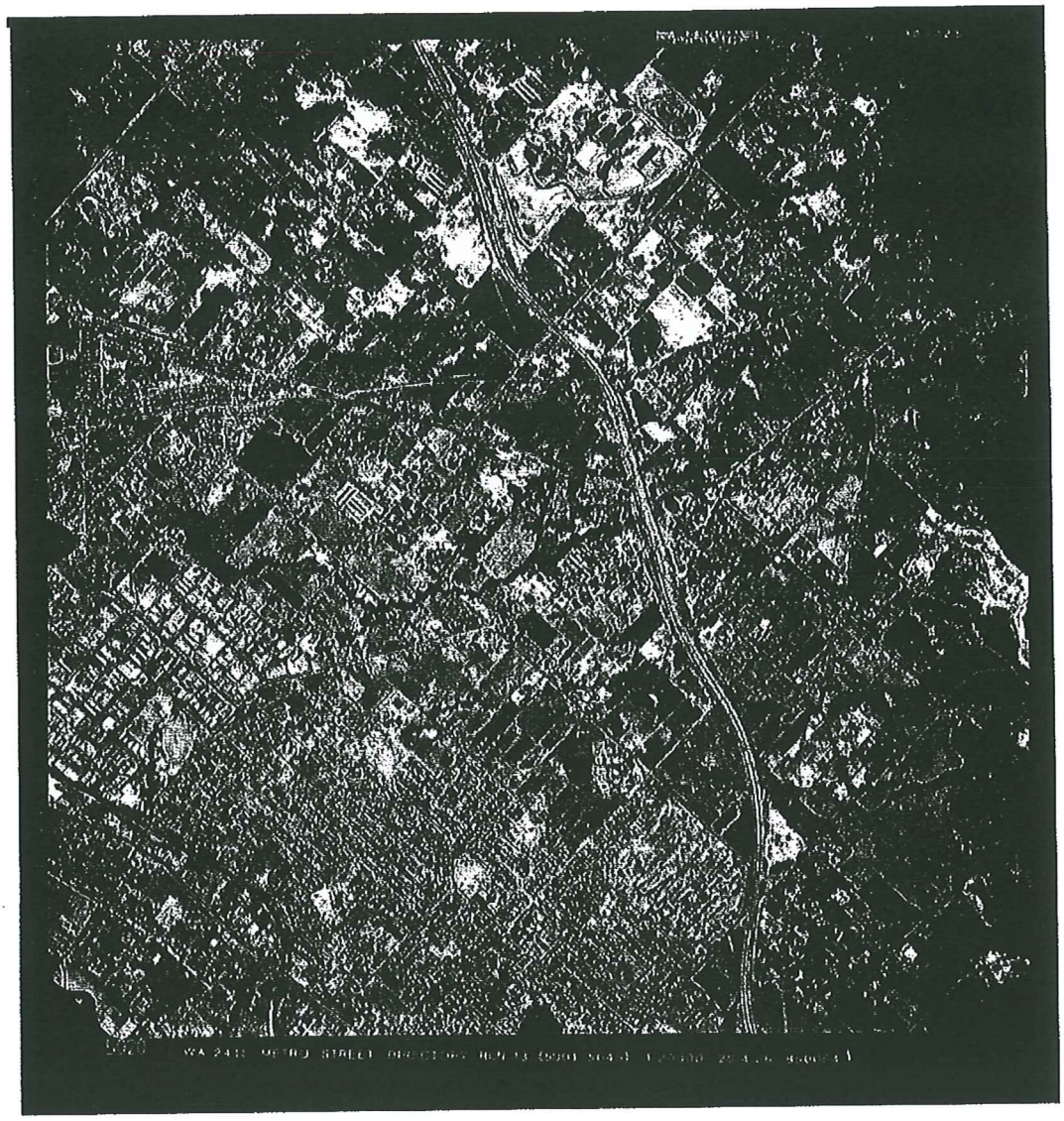
J Revell

Ann Revell
FOI COORDINATOR
RESOURCES SAFETY
18 December 2006

APPENDIX F

Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 17 December 2005

Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 7 January 1997



Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 20 April 1986

Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 18 June 1976

Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 13 March 1967

Aerial Photograph: Lots 5, 6, 414 Maddington Road, Maddington 9 December 1949

APPENDIX G

Job Number: J06061 - Maddington Rd, Maddington

Lot 5

Date	Volume	Folio	Grantee	Occupation	Size	Comments
18/11/2005	1654	20	Thi Loan Kim, Thanh Ngoc Kim (1/2)		4 acres	Transfer & split between 2 parties
			Michelle Phan (1/2)			
2/03/1999	1654	20	Garth Aylmer Curran		4 acres	Transfer
30/12/1992	1654	20	Frank James Doig & Julia Doig (2/3)		4 acres	Transfer & split between 2 parties
			Patricia Elizabeth Haines (1/3)			
31/10/1984	1654	20	Frank James Doig & Julia Doig	Carrier	4 acres	Transfer
21/10/01983	1654	20	Roger Kenneth Hickman	Business Proprietor	4 acres	New COT
23/07/1979	1276	385	Port Kennedy Estate Development Corporation Pty Ltd		8 acres	Transfer
19/04/1978	1276	385	Mansard Developments Pty Ltd		8 acres	Transfer
9/01/1973	1276	385	Peter Wolfgang Eckhart & Elizabeth Marjory Eckhard	Medical Practitioner	8 acres	Transfer
22/05/1964	1276	385	Albert Edward Reid	Taxation Official	8 acres	Transfer
7/11/1963	1276	385	Maxwell Sydney Barr	Farmer & Storekeeper	8 acres	Transfer
27/09/1963	1276	385	Robert William Barr	Retired Farmer	8 acres	New COT (Lots 5 & 6)
19/03/1954	1124	888	Richard Newman John Butler & William James Wallace Butler	Carpenters	5 acres	Transfer
19/10/1953	1124	888	Mary Butler	Widow	5 acres	Transfer due to death of Richard Butler
14/02/1952	1124	888	Richard William Howard Butler	Retired Architect	5 acres	Transfer
25/03/1950	1124	888	Reuben Auburn Baron	Brewery Employee	5 acres	New COT
24/05/1928	741	92	John Samuel Bridgman	Journalist	10 acres	Transfer
22/05/1920	741	92	Thomas Hagan		10 acres	Transfer by Endorsement
22/05/1920	741	92	Christina Mabel Rosling		10 acres	New COT
1/01/1916	656	70	The Western Australian Bank	Bank	2097 acres	New COT
20/12/1914	607	198	Frank Morley Alcock	Solicitor	2118 acres	New COT
30/06/1909	444	169	Frank Morley Alcock	Solicitor	2449 acres	New COT
26/02/1907	300	187	John Frederick Roe & George Arthur Clifton		3158 acres	Transfer due to death of James Brown Roe
26/03/1904	300	187	James Brown Roe	Esquire	3158 acres	Transfer
11/06/1883	11	179	James Brown Roe	Esquire	3280 acres	New COT
6/12/1832	EC	10	William Nairn	Esquire	1280 acres	New COT

Lot 6

Date	Volume	Folio	Shed Owner	Occupation	Size	Comment
11/10/2006	1659	346	Greystones Development Pty Ltd		4 acres	Transfer
8/08/2000	1659	346	Luke Gerard Van Reekan & Kathleen Patricia Sherlock		4 acres	Transfer
21/11/1988	1659	346	Bradley Keith Evans & Julie Marie Evans		4 acres	Transfer
18/12/1984	1659	346	Sebastiano Gullotti & Nunciata Gullotti		4 acres	Transfer
19/01/1984	1659	346	Port Kennedy Estate Development Corporation Pty Ltd		4 acres	New COT
23/07/1979	1276	385	Port Kennedy Estate Development Corporation Pty Ltd		8 acres	Transfer
19/04/1978	1276	385	Mansard Developments Pty Ltd		8 acres	Transfer
9/01/1973	1276	385	Peter Wolfgang Eckhart & Elizabeth Marjory Eckhard	Medical Practitioner	8 acres	Transfer
22/05/1964	1276	385	Albert Edward Reid	Taxation Official	8 acres	Transfer
7/11/1963	1276	385	Maxwell Sydney Barr	Farmer & Storekeeper	8 acres	Transfer
27/09/1963	1276	385	Robert William Barr	Retired Farmer	8 acres	New COT (Lots 5 & 6)
19/03/1954	1000	581	Richard Newman John Butler & William Wallis Butler	Carpenters	10 acres	Transfer
19/10/1953	1000	581	Mary Caroline Butler		10 acres	Transfer due to death of Richard Butler
26/10/1938	1000	581	Richard William Howard Butler	Architect	10 acres	Transfer
24/05/1928	1000	581	John Samuel Bridgman	Journalist	10 acres	New COT
22/05/1920	741	92	Thomas Hagan		10 acres	Transfer by Endorsement
22/05/1920	741	92	Christina Mabel Rosling		10 acres	New COT
1/01/1916	656	70	The Western Australian Bank	Bank	2097 acres	New COT
20/12/1914	607	198	Frank Morley Alcock	Solicitor	2118 acres	New COT
30/06/1909	444	169	Frank Morley Alcock	Solicitor	2449 acres	New COT
26/02/1907	300	187	John Frederick Roe & George Arthur Clifton		3158 acres	Transfer due to death of James Brown Roe
26/03/1904	300	187	James Brown Roe	Esquire	3158 acres	Transfer
11/06/1883	11	179	James Brown Roe	Esquire	3280 acres	New COT
6/12/1832	EC	10	William Nairn	Esquire	1280 acres	New COT

Lot 414

Date	Volume	Folio	Grantee	Occupation	Area	Comments
22/08/2005	1537	594	Van Minh Chung		6 acres	Transfer
			Quoc Tan Phan			
			Chi Dung Nguyen			
6/06/2000	1537	594	Richard Arthur Lilley & Ann Leigh Lilley		6 acres	Transfer
5/05/1983	1537	594	R.A.L Holdings Pty Ltd		6 acres	Transfer
23/07/1979	1537	594	Port Kennedy Estate Development Corporation Pty Ltd		6 acres	New COT
19/04/1978	1081	847	Mansard Developments Pty Ltd		5 acres	Transfer
26/02/1970	1081	847	Stavros Firras		5 acres	Transfer due to death of Gertrude Finnerty
26/05/1965	1081	847	Stavros Firras & Gertrude May Finnerty	Proprietor	5 acres	Transfer
6/08/1954	1081	847	Giuseppe Santostefeno	Labourer	5 acres	Transfer
23/06/1952	1081	847	Howard Solomon		5 acres	Transfer due to death of Terence Reid
16/04/1946	1081	847	Terence Joseph Reid	Retired Farmer	5 acres	Transfer
26/12/1945	1081	847	Gilbert Alfred Herbert	Pensioner	5 acres	Transfer due to death of Rebecca Herbert
16/12/1943	1081	847	Gilbert Alfred Herbert & Rebecca Herbert	Pensioners	5 acres	New COT for Lot 414 Only
22/04/1936	991	120	Mabel Peet	Widow	524 acres	Transfer
8/02/1928	991	120	James Thomas Peet & Mabel Peet	Estate Agent	524 acres	New COT for some of lot outlined 966:61
25/06/1927	966	61	Bank of New South Wales	Bank	1175 acres	Transfer
15/06/1927	966	61	The Western Australian Bank	Bank	1175 acres	New COT for some of lot outlined 926:188
27/06/1926	926	188	The Western Australian Bank	Bank	1219 acres	New COT
1/01/1916	656	70	The Western Australian Bank	Bank	2097 acres	New COT
20/12/1914	607	198	Frank Morley Alcock	Solicitor	2118 acres	New COT
30/06/1909	444	169	Frank Morley Alcock	Solicitor	2449 acres	New COT
26/02/1907	300	187	John Frederick Roe & George Arthur Clifton		3158 acres	Transfer due to death of James Brown Roe
26/03/1904	300	187	James Brown Roe	Esquire	3158 acres	Transfer
11/06/1883	11	179	James Brown Roe	Esquire	3280 acres	New COT
6/12/1832	EC	10	William Nairn	Esquire	1280 acres	New COT

APPENDIX H

BGE
Brown Geotechnical & Environmental
4/47 Monash Avenue, Como
WA 6152
Telephone: (08) 9368 2615
Fax: (08) 9367 7409

BOREHOLE NUMBER MB01

CLIENT Greystones Development Pty
PROJECT NAME 5, 6 & 414 Maddington Road
PROJECT NUMBER J06061
PROJECT LOCATION Maddington

DATE STARTED 10/02/07 COMPLETED 10/02/07
R.L. SURFACE
DATUM
DRILLING CONTRACTOR G.S Drilling
SLOPE 90°
BEARING ---
EQUIPMENT Drilling rig
HOLE LOCATION 116.005372E 32.041995S MGA
HOLE SIZE 100mm
LOGGED BY MS
CHECKED BY GP
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0			TOPSOIL: Loose, medium, grey, dry, many roots		
					SP-SM	SAND: Medium dense, medium, grey, with silt, dry		
					Cl	SANDY CLAY: Very stiff, medium plasticity, orange-brown, w<wp		
			1					
			2					
			3					
	4.7							
			4					
	▼		5					
			6					
			7					

Borehole MB01 terminated at 7m

BOREHOLE / TEST PIT MBLOGS.GPJ GINT AUSTRALIA.GDT 11/07/07

BGE Brown Geotechnical & Environmental
4/47 Monash Avenue, Como
WA 6152
Telephone: (08) 9368 2615
Fax: (08) 9367 7409

BOREHOLE NUMBER MB02

CLIENT Greystones Development Pty
PROJECT NAME 5, 6 & 414 Maddington Road
PROJECT NUMBER J06061
PROJECT LOCATION Maddington

DATE STARTED 10/02/07 COMPLETED 10/02/07
R.L. SURFACE
DATUM
DRILLING CONTRACTOR G.S Drilling
SLOPE 90°
BEARING ---
EQUIPMENT Drilling rig
HOLE LOCATION 116.006537E 32.040872S MGA
HOLE SIZE 100mm
LOGGED BY MS
CHECKED BY GP
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0			TOPSOIL: Loose, medium, grey, dry, with rootlets		
					SP-SM	SAND: Medium dense, medium, grey, with silt, dry		
					CI	SANDY CLAY: Very stiff, medium plasticity, orange-brown, w<wp		
			1					
			2					
			3					
	4.5							
			4					
			5					
			6					
			7			Borehole MB02 terminated at 6.5m		

BOREHOLE / TEST PIT MBLOGS.GPJ GINT AUSTRALIA.GDT 11/07/07

BGE
Brown Geotechnical & Environmental
4/47 Monash Avenue, Como
WA 6152
Telephone: (08) 9368 2615
Fax: (08) 9367 7409

BOREHOLE NUMBER MB03

CLIENT Greystones Development Pty
PROJECT NAME 5, 6 & 414 Maddington Road
PROJECT NUMBER J06061
PROJECT LOCATION Maddington

DATE STARTED 10/02/07 COMPLETED 10/02/07
R.L. SURFACE
DATUM
DRILLING CONTRACTOR G.S Drilling
SLOPE 90°
BEARING ---
EQUIPMENT Drilling rig
HOLE LOCATION 116.008248E 32.043191S MGA
HOLE SIZE 100mm
LOGGED BY MS
CHECKED BY GP
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, medium, grey, dry, rootlets, with clay		
					CI	SANDY CLAY: Very stiff, medium plasticity, orange-brown, w<wp		
			1			mottled red-brown and grey below 0.7m		
						very hard below 1.1m		
	3 ▼		2					
			3					
			4					
			5			Borehole MB03 terminated at 5m		
			6					
			7					

APPENDIX I

ecoinformation management system

Groundwater Field Parameters

Job Number: J06061 **Sampling Point:** MB01

Project: Mullingar Rd **Site Location:** "	**Purging Date:** 20/2/07 **Sampling Date:** 20/2/07
MGA Grid Coordinates (WGS 84):	Well depth from TOC (m): 7
Easting: 116.025372	Depth to groundwater from TOC (m): 4.741
Northing: 32.041995	Depth to be purged (m): 2

Purging Information

Purge 5 casing volumes or until 'dry'
1 casing volume = 2L/m for wells of 50mm ID
1 casing volume = 8 L/m for wells of 100mm ID

Method/pump type: subm O bailer ✓ GrundfosMPI O	One purge volume: 4 litres:
Tubing material: HDPE O PVC ✓ S/Steel O	No. of times purges: 5
Start time (2400hr):	Total purge volume: 20 litres:

Field Results While Purging

	pH	Conductivity (mS.cm)	Redox (mV)	DO (ppm)	Temp. °C
After 1 purge volume:	6.39	4.50	61	2.13	21.7
After 4 purge volumes:	6.47	4.67	30	2.50	21.8
After 5 purge volumes:	6.23	7.00	23	2.84	20.4
Extra if required					
Extra if required					

Measurements for pH should be within 0.1 pH units and measurements for conductivity, salinity and dissolved oxygen should be within 10% and temperature within 0.5 °C before the well is sampled.

Are the field results acceptable to allow sampling? (circle one) **Yes** No (If No, append additional purge data)

Sampling Details	Analysis Required (tick if yes)	
Method/pump type: waterra O bailer ✓ GrundfosMPI O	TPH	Ammonia
Tubing material: HDPE O PVC ✓ S/Steel O	BTEX	SVOCs
Is there a hydrocarbon sheen?: Yes No	VOCs	CrVI
Odour:	Cyanide	Other
Colour:	PAHs	Other
Turbidity: L M H	Metals (see custody form for list)	

Weather Conditions

Rain:	Temperature: °C	Cloud cover: %

Other comments and observations:

Sampler's name: Jim Pemberton	Signature: Jim Pemberton

Procedures based on ... Australian ... sampling of groundwaters

water information management system

Groundwater Field Parameters

Job Number: J06061 **Sampling Point:** MB02

Project: Maddington Rd **Site Location:**	**Purging Date:** 20/2/07 **Sampling Date:** 20/2/07
MGA Grid Coordinates (WGS 84):	Well depth from TOC (m): 5.5
Easting: 116.006537	Depth to groundwater from TOC (m): 4.461
Northing: 32.040872	Depth to be purged (m): 2

Purging Information

Purge 5 casing volumes or until 'dry'
1 casing volume = 2L/m for wells of 50mm ID
1 casing volume = 8 L/m for wells of 100mm ID

Method/pump type: subm O bailer Ø GrundfosMPI O	One purge volume: 4 litres:
Tubing material: HDPE O PVC Ø S/Steel O	No. of times purges: 5
Start time (2400hr):	Total purge volume: 20 litres:

Field Results While Purging

	pH	Conductivity (mS.cm)	Redox (mV)	DO (ppm)	Temp. °C
After 1 purge volume:	6.11	2.27	168	3.71	26.4
After 4 purge volumes:	6.16	3.00	97	3.60	23.3
After 5 purge volumes:	6.03	3.06	102	2.56	23.2
Extra if required					
Extra if required					

Measurements for pH should be within 0.1 pH units and measurements for conductivity, salinity and dissolved oxygen should be within 10% and temperature within 0.5 °C before the well is sampled.

Are the field results acceptable to allow sampling? (circle one) (Yes) No (If No, append additional purge data)

Sampling Details	Analysis Required (tick if yes)	
Method/pump type: waterra O bailer Ø GrundfosMPI O	TPH	Ammonia
Tubing material HDPE O PVC Ø S/Steel O	BTEX	SVOCs
Is there a hydrocarbon sheen?: Yes No	VOCs	CrVI
Odour:	Cyanide	Other
Colour:	PAHs	Other
Turbidity L M H	Metals (see custody form for list)	

Weather Conditions

Rain	Temperature: °C	Cloud cover: %

Other comments and observations:

Sampler's name: Gary Pemberton Signature: Gary Pemberton

Produced based on AS/NZS 5667.11:1998 Water Quality – Sampling – Guidance on sampling of groundwaters

Groundwater Field Parameters

Job Number: Jc6061 **Sampling Point:** MW03

Project: Maddington Rd **Site Location:**	**Purging Date:** 20/2/07 **Sampling Date:** 20/2/07
MGA Grid Coordinates (WGS 84):	Well depth from TOC (m): 5
Easting: 116.008268	Depth to groundwater from TOC (m): 3.061
Northing: 32.043191	Depth to be purged (m): 2

Purging Information

Purge 5 casing volumes or until 'dry'
1 casing volume = 2L/m for wells of 50mm ID
1 casing volume = 8 L/m for wells of 100mm ID

Method/pump type: subm O bailer ✓ GrundfosMPI O	One purge volume: 4 litres:
Tubing material: HDPE O PVC ✓ S/Steel O	No. of times purges: 5
Start time (2400hr):	Total purge volume: 20 litres:

Field Results While Purging

	pH	Conductivity (µS/cm)	Redox (mV)	DO (ppm)	Temp. °C
After 1 purge volume:	6.27	1335	73	2.12	26.3
After 4 purge volumes:	6.59	1238	43	2.22	23.7
After 5 purge volumes:	6.68	1175	37	2.69	23.3
Extra if required					
Extra if required					

Measurements for pH should be within 0.1 pH units and measurements for conductivity, salinity and dissolved oxygen should be within 10% and temperature within 0.5 °C before the well is sampled.

Are the field results acceptable to allow sampling? (circle one) (Yes) No (If No, append additional purge data)

Sampling Details	Analysis Required (tick if yes)	
Method/pump type: waterra O bailer ✓ GrundfosMPI O	TPH	Ammonia
Tubing material: HDPE O PVC ✓ S/Steel O	BTEX	SVOCs
Is there a hydrocarbon sheen?: Yes No	VOCs	CrVI
Odour:	Cyanide	Other
Colour:	PAHs	Other
Turbidity: L M H	Metals (see custody form for list)	

Weather Conditions

Rain:	Temperature: °C	Cloud cover: %

Other comments and observations:

Sampler's name: Jon Pemberton Signature: Jon Pemberton

APPENDIX J

Table 1 – Groundwater Metals

Sample Name	Sample Date	Total Metals by ICP-MS (mg/L)							Total Mercury by FIMS
		Arsenic	Cadium	Chromium	Copper	Lead	Nickel	Zinc	Mercury
MB01	20/02/07	0.002	0.0008	0.010	0.130	0.176	0.078	0.105	0.0001
MB02	20/02/07	<0.001	<0.0001	0.007	0.034	0.020	0.018	0.055	<0.0001
MB03	20/02/07	<0.001	<0.0001	0.004	0.016	0.017	0.004	0.013	0.0001
QA1	20/02/07	<0.001	0.0007	0.009	0.126	0.129	0.074	0.099	0.0001

Table 2 – Organochlorine Pesticides (OC)/ Organophosphorus Pesticides (OP)

Organochlorine Pesticides (µg/L)	Adopted Investigation Levels (mg/L)	Sample Date	MB01	MB02	MB03
Aldrin	0.0003	20/02/07	<0.010	<0.010	<0.010
alpha-BHC		20/02/07	<0.010	<0.010	<0.010
beta-BHC		20/02/07	<0.010	<0.010	<0.010
delta-BHC		20/02/07	<0.010	<0.010	<0.010
4.4'-DDD		20/02/07	<0.010	<0.010	<0.010
4.4'-DDE		20/02/07	<0.010	<0.010	<0.010
4.4'-DDT		20/02/07	<0.010	<0.010	<0.010
DDT (total)	0.02	20/02/07	<0.010	<0.010	<0.010
Dieldrin	0.0003	20/02/07	<0.010	<0.010	<0.010
alpha-Endosulfan		20/02/07	<0.010	<0.010	<0.010
beta-Endosulfan		20/02/07	<0.010	<0.010	<0.010
Endosulfan sulfate		20/02/07	<0.010	<0.010	<0.010
Endosulfan		20/02/07	<0.010	<0.010	<0.010
Endrin		20/02/07	<0.010	<0.010	<0.010
Endrin aldehyde		20/02/07	<0.010	<0.010	<0.010
Endrin ketone		20/02/07	<0.010	<0.010	<0.010
Heptachlor		20/02/07	<0.005	<0.005	<0.005
Hexachlorobenzene (HCB)		20/02/07	<0.010	<0.010	<0.010
Heptachlor epoxide		20/02/07	<0.010	<0.010	<0.010
gamma-BHC		20/02/07	<0.010	<0.010	<0.010
Methoxychlor		20/02/07	<0.010	<0.010	<0.010
cis-Chlorodane		20/02/07	<0.010	<0.010	<0.010
trans-chlorodane		20/02/07	<0.010	<0.010	<0.010
Total Chlorodane	0.001	20/02/07	<0.010	<0.010	<0.010

Table 2 – Organochlorine Pesticides (OC)/ Organophosphorus Pesticides (OP) Cont.

Organochlorine Pesticides (µg/L)	Adopted Investigation Levels	Sample Date	MB01	MB02	MB03
Bromophos-ethyl		20/02/07	<0.10	<0.10	<0.10
Carbophenothion		20/02/07	<0.10	<0.10	<0.10
Chlorofenvinphos		20/02/07	<0.10	<0.10	<0.10
Chloropyrifos	0.03	20/02/07	<0.100	<0.100	<0.100
Chlorpyrifos-methyl		20/02/07	<0.05	<0.05	<0.05
Demeton-S-methyl		20/02/07	<0.10	<0.10	<0.10
Diazinon	0.003	20/02/07	<0.10	<0.10	<0.10
Dichlorvos		20/02/07	<0.10	<0.10	<0.10
Dimethoate		20/02/07	<0.10	<0.10	<0.10
Ethion		20/02/07	<0.10	<0.10	<0.10
Fenamiphos		20/02/07	<0.10	<0.10	<0.10
Fenthion		20/02/07	<0.10	<0.10	<0.10
Malathion		20/02/07	<0.10	<0.10	<0.10
Azinphos Methyl		20/02/07	<0.10	<0.10	<0.10
Monosrotophos		20/02/07	<0.10	<0.10	<0.10
Parathion		20/02/07	<0.10	<0.10	<0.10
Parathion-methyl		20/02/07	<0.10	<0.10	<0.10
Pirimphos-methyl		20/02/07	<0.10	<0.10	<0.10
Prothiofos		20/02/07	<0.10	<0.10	<0.10

APPENDIX K

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: Bowman Geotechnical and Environmental	SAMPLER: G. Pemberton
ADDRESS / OFFICE: 4/47 Monash Ave, Como, WA 6152.	MOBILE: 0439 948 545
PROJECT MANAGER (PM): Gina Pemberton	PHONE: (08) 93682615
PROJECT ID: J06062	EMAIL REPORT TO: ginapemberton@bowmangeo.com.au
SITE:	PO NO:
RESULTS REQUIRED (Date): 7 days	QUOTE NO: PEN/063/06
EMAIL INVOICE TO: (if different to report) Same as above	

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Australian Laboratory Services Pty Ltd

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE:
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc

SAMPLE INFORMATION (note S = Soil, W=Water)					CONTAINER INFORMATION	
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
1	MB01	W	20/2			3
2	MB02 Red sample					
3	MB03					
4	QA1					

Environmental Division
Perth
Work Order
EP0700712

Telephone : 61-8-9209 7655

RELINQUISHED BY		RECEIVED BY		METHOD OF SHIPMENT
Name: G. Pemberton	Date: 22/02/07	Name: Melissa Hams	Date: 22/2/07	Con' Note No:
Of: BGE	Time: 9.10am	Of: ALSE	Time: 1126	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved,
V = VOA Vial HCl Preserved, VS = VOA Vial Sulphuric Preserved, SG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass,
Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles; ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag

AUSTRALIAN LABORATORY SERVICES P/L

QA1 Amber is QA1's second Amber as per G.P 22/2/07 [illegible]

Bottles say J06061, ~~60~~ as per COC.
as per G.P. 22/2/07 [illegible]

Received 2 x MB01. no MB02 - MB02 is Red sample as per G.P. 22/2/07 [illegible]

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: BROWN GEOTECHNICAL AND ENVIRONMENTAL	*Laboratory*	: Environmental Division Perth	*Page*	: 1 of 5
Contact	: MS GINA PEMBERTON	*Contact*	: Shaun Crabb	*Work Order*	: EP0700712
Address	: SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	*Address*	: 10 Hod Way Malaga WA Australia 6090		
E-mail	: ginapemberton@acidss.com.au	*E-mail*	: Shaun.Crabb@alsenviro.com		
Telephone	: 08 9368 2615	*Telephone*	: 61-8-9209 7655		
Facsimile	: - Not provided -	*Facsimile*	: 61-8-9209 7600		
Project	: J06062	*Quote number*	: PEN-063-06	*Date received*	: 22 Feb 2007
Order number	: - Not provided -			*Date issued*	: 8 Mar 2007
C-O-C number	: - Not provided -			*No. of samples*	- *Received* : 4
Site	: - Not provided -				*Analysed* : 4

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

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

Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*
Rassem Ayoubi	Senior Organic Chemist	Organics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference EP0700712 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **EP0700712**

EP130: Low Matrix Spike recoveries due to sample matrix interferences.

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MB01	MB02	MB03	QA1	
Sample Matrix Type / Description:				WATER	WATER	WATER	WATER	
Sample Date / Time:				20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	
Laboratory Sample ID:				EP0700712-001	EP0700712-002	EP0700712-003	EP0700712-004	
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Carbophenothion	786-19-6	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Chlorfenvinphos (Z)	470-90-8	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Chlorpyrifos	2921-88-2	0.050	µg/L	<0.050	<0.050	<0.050	<0.050	
Chlorpyrifos-methyl	5598-13-0	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Demeton-S-methyl	919-86-8	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Diazinon	333-41-5	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Dichlorvos	62-73-7	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Dimethoate	60-51-5	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Ethion	563-12-2	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Fenamiphos	22224-92-6	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Fenthion	55-38-9	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Malathion	121-75-5	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Azinphos Methyl	86-50-0	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Monocrotophos	6923-22-4	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Parathion	56-38-2	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Parathion-methyl	298-00-0	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Pirimphos-ethyl	23505-41-1	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
Prothiofos	34643-46-4	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
4.4'-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
4.4'-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
4.4'-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
DDT (total)		0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Endosulfan	115-29-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	

ALS Environmental

Analytical Results

	Client Sample ID :	MB01	MB02	MB03	QA1	
	Sample Matrix Type / Description :	WATER	WATER	WATER	WATER	
	Sample Date / Time :	20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	
	Laboratory Sample ID :	EP0700712-001	EP0700712-002	EP0700712-003	EP0700712-004	
Analyte	CAS number	LOR Units				
EP131A: Organochlorine Pesticides						
Heptachlor epoxide	1024-57-3	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene (HCB)	118-74-1	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
gamma-BHC	58-89-9	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
Methoxychlor	72-43-5	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
cis-Chlordane	5103-71-9	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
trans-Chlordane	5103-74-2	0.010 µg/L	<0.010	<0.010	<0.010	<0.010
Total Chlordane		0.010 µg/L	<0.010	<0.010	<0.010	<0.010
EP130S: Organophosphorus Pesticide Surrogate						
DEF	78-48-8	0.1 %	48.0	83.3	89.8	89.5
EP131S: OC Pesticide Surrogate						
Dibromo-DDE	21655-73-2	0.1 %	82.1	77.3	81.7	70.6

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - Surrogate Control Limits

Method name	Analyte name	Surrogate Control Limits	
		Lower Limit	Upper Limit
EP130: Organophosphorus Pesticides (Ultra-trace)			
EP130S: Organophosphorus Pesticide Surrogate	DEF	32	136.4
EP131A: Organochlorine Pesticides (Ultra-trace)			
EP131S: OC Pesticide Surrogate	Dibromo-DDE	10	136

ALS Environmental

QUALITY CONTROL REPORT

Client	: BROWN GEOTECHNICAL AND ENVIRO	**Laboratory**	: Environmental Division Perth	**Page**	: 1 of 8
Contact	: GINA PEMBERTON	**Contact**	: Shaun Crabb		
Address	: SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	**Address**	: 10 Hod Way Malaga WA Australia 6090	**Work order**	: EP0700712
				Amendment No.	:
Project	: J06062	**Quote number**	: PEN-063-06	**Date received**	: 22 Feb 2007
Order number	: - Not provided -			**Date issued**	: 8 Mar 2007
C-O-C number	: - Not provided -				
Site	: - Not provided -				
E-mail	: ginapemberton@acidss.com.au	**E-mail**	: Shaun.Crabb@alsenviro.com	**No. of samples**	
Telephone	: 08 9368 2615	**Telephone**	: 61-8-9209 7655	**Received**	: 4
Facsimile	: - Not provided -	**Facsimile**	: 61-8-9209 7600	**Analysed**	: 4

This final report for the ALSE work order reference EP0700712 supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EP130: Low Matrix Spike recoveries due to sample matrix interferences.

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NATA Accredited Laboratory - 825

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

Accredited for compliance with ISO/IED 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Department
Rassem Ayoubi	Organics - NATA 825 (10911 - Sydney)

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP130A: Organophosphorus Pesticides (Ultra-trace)						
EP130A: Organophosphorus Pesticides (Ultra-trace) - (QC Lot: 360516)				µg/L	µg/L	%
EP0700712-001	MB01	Bromophos-ethyl	0.10 µg/L	<0.10	<0.10	0.0
		Carbophenothion	0.10 µg/L	<0.10	<0.10	0.0
		Chlorfenvinphos (Z)	0.10 µg/L	<0.10	<0.10	0.0
		Chlorpyrifos	0.050 µg/L	<0.050	<0.050	0.0
		Chlorpyrifos-methyl	0.10 µg/L	<0.10	<0.10	0.0
		Demeton-S-methyl	0.10 µg/L	<0.10	<0.10	0.0
		Diazinon	0.10 µg/L	<0.10	<0.10	0.0
		Dichlorvos	0.10 µg/L	<0.10	<0.10	0.0
		Dimethoate	0.10 µg/L	<0.10	<0.10	0.0
		Ethion	0.10 µg/L	<0.10	<0.10	0.0
		Fenamiphos	0.10 µg/L	<0.10	<0.10	0.0
		Fenthion	0.10 µg/L	<0.10	<0.10	0.0
		Malathion	0.10 µg/L	<0.10	<0.10	0.0
		Methyl Azinphos	0.10 µg/L	<0.10	<0.10	0.0
		Monocrotophos	0.10 µg/L	<0.10	<0.10	0.0
		Parathion	0.10 µg/L	<0.10	<0.10	0.0
		Parathion-methyl	0.10 µg/L	<0.10	<0.10	0.0
		Pirimphos-ethyl	0.10 µg/L	<0.10	<0.10	0.0
		Prothiofos	0.10 µg/L	<0.10	<0.10	0.0
EP131A: Organochlorine Pesticides						
EP131A: Organochlorine Pesticides - (QC Lot: 360515)				µg/L	µg/L	%
EP0700712-001	MB01	Aldrin	0.010 µg/L	<0.010	<0.010	0.0
		alpha-BHC	0.010 µg/L	<0.010	<0.010	0.0
		beta-BHC	0.010 µg/L	<0.010	<0.010	0.0
		delta-BHC	0.010 µg/L	<0.010	<0.010	0.0

Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP131A: Organochlorine Pesticides - continued						
EP131A: Organochlorine Pesticides - (QC Lot: 360515) - continued				µg/L	µg/L	%
EP0700712-001	MB01	4,4'-DDD	0.010 µg/L	<0.010	<0.010	0.0
		4,4'-DDE	0.010 µg/L	<0.010	<0.010	0.0
		4,4'-DDT	0.010 µg/L	<0.010	<0.010	0.0
		DDT (total)	0.010 µg/L	<0.010	<0.010	0.0
		Dieldrin	0.010 µg/L	<0.010	<0.010	0.0
		alpha-Endosulfan	0.010 µg/L	<0.010	<0.010	0.0
		beta-Endosulfan	0.010 µg/L	<0.010	<0.010	0.0
		Endosulfan sulfate	0.010 µg/L	<0.010	<0.010	0.0
		Endosulfan (sum)	0.010 µg/L	<0.010	<0.010	0.0
		Endrin	0.010 µg/L	<0.010	<0.010	0.0
		Endrin aldehyde	0.010 µg/L	<0.010	<0.010	0.0
		Endrin ketone	0.010 µg/L	<0.010	<0.010	0.0
		Heptachlor	0.005 µg/L	<0.005	<0.005	0.0
		Heptachlor epoxide	0.010 µg/L	<0.010	<0.010	0.0
		Hexachlorobenzene (HCB)	0.010 µg/L	<0.010	<0.010	0.0
		gamma-BHC	0.010 µg/L	<0.010	<0.010	0.0
		Methoxychlor	0.010 µg/L	<0.010	<0.010	0.0
		cis-Chlordane	0.010 µg/L	<0.010	<0.010	0.0
		trans-Chlordane	0.010 µg/L	<0.010	<0.010	0.0
		Total Chlordane (sum)	0.010 µg/L	<0.010	<0.010	0.0

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace)						
EP130A: Organophosphorus Pesticides (Ultra-trace) - (QC Lot: 360516)		µg/L	µg/L	%	%	%
Methyl Azinphos	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	74.4	1.35	163
Bromophos-ethyl	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	98.0	35.4	143
Carbophenothion	0.10 µg/L	---	1.0	55.9	5.13	171
	0.10 µg/L	<0.10	---	---	---	---
Chlorfenvinphos (Z)	0.09 µg/L	---	0.9	92.1	44.6	155
	0.10 µg/L	<0.10	---	---	---	---
Chlorpyrifos	0.05 µg/L	---	1.0	80.2	38.5	145
	0.050 µg/L	<0.050	---	---	---	---
Chlorpyrifos-methyl	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	93.6	40.3	135
Demeton-S-methyl	0.10 µg/L	---	1.0	124	20.7	178
	0.10 µg/L	<0.10	---	---	---	---
Diazinon	0.10 µg/L	---	1.0	100	38.7	146
	0.10 µg/L	<0.10	---	---	---	---
Dichlorvos	0.10 µg/L	---	1.0	125	18.4	151
	0.10 µg/L	<0.10	---	---	---	---
Dimethoate	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	102	27.4	131
Ethion	0.10 µg/L	---	1.0	74.9	36.1	147
	0.10 µg/L	<0.10	---	---	---	---
Fenamiphos	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	83.7	4.43	168
Fenthion	0.10 µg/L	---	1.0	77.0	23.2	145
	0.10 µg/L	<0.10	---	---	---	---

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix Type: WATER

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP130A: Organophosphorus Pesticides (Ultra-trace) - continued						
EP130A: Organophosphorus Pesticides (Ultra-trace) - (QC Lot: 360516) - continued		µg/L	µg/L	%	%	%
Malathion	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	89.7	40.7	136
Monocrotophos	0.10 µg/L	---	1.0	26.5	10	86.3
	0.10 µg/L	<0.10	---	---	---	---
Parathion	0.10 µg/L	---	1.0	75.5	35.5	141
	0.10 µg/L	<0.10	---	---	---	---
Parathion-methyl	0.10 µg/L	---	1.0	89.0	31.1	144
	0.10 µg/L	<0.10	---	---	---	---
Pirimphos-ethyl	0.10 µg/L	<0.10	---	---	---	---
	0.10 µg/L	---	1.0	77.2	38.9	142
Prothiofos	0.10 µg/L	---	1.0	74.9	40	138
	0.10 µg/L	<0.10	---	---	---	---
EP131A: Organochlorine Pesticides						
EP131A: Organochlorine Pesticides - (QC Lot: 360515)		µg/L	µg/L	%	%	%
4,4'-DDD	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	103	37.5	145
4,4'-DDE	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	86.3	30.5	146
4,4'-DDT	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	82.8	31	151
Aldrin	0.010 µg/L	<0.001	---	---	---	---
	0.001 µg/L	---	0.1	90.8	35.8	139
alpha-BHC	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	102	19.7	153
alpha-Endosulfan	0.001 µg/L	---	0.1	92.3	30.2	141
	0.010 µg/L	<0.010	---	---	---	---
beta-BHC	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	90.7	43.8	136
beta-Endosulfan	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	102	30.3	148

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix Type: WATER

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP131A: Organochlorine Pesticides - continued						
EP131A: Organochlorine Pesticides - (QC Lot: 360515) - continued		µg/L	µg/L	%	%	%
cis-Chlordane	0.001 µg/L	---	0.1	84.3	15.4	152
	0.010 µg/L	<0.010	---	---	---	---
DDT (total)	0.010 µg/L	<0.010	---	---	---	---
delta-BHC	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	93.4	37.4	144
Dieldrin	0.001 µg/L	---	0.1	106	34.4	145
	0.010 µg/L	<0.010	---	---	---	---
Endosulfan (sum)	0.010 µg/L	<0.010	---	---	---	---
Endosulfan sulfate	0.001 µg/L	---	0.1	93.9	19.1	150
	0.010 µg/L	<0.010	---	---	---	---
Endrin	0.001 µg/L	---	0.1	113	13	165
	0.010 µg/L	<0.010	---	---	---	---
Endrin aldehyde	0.001 µg/L	---	0.1	90.4	28.3	134
	0.010 µg/L	<0.010	---	---	---	---
Endrin ketone	0.001 µg/L	---	0.1	104	15.1	146
	0.010 µg/L	<0.010	---	---	---	---
gamma-BHC	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	102	27.2	147
Heptachlor	0.001 µg/L	---	0.1	115	33.2	148
	0.050 µg/L	<0.050	---	---	---	---
Heptachlor epoxide	0.010 µg/L	<0.010	---	---	---	---
	0.001 µg/L	---	0.1	104	36	143
Hexachlorobenzene (HCB)	0.001 µg/L	---	0.1	65.6	14	146
	0.010 µg/L	<0.010	---	---	---	---
Methoxychlor	0.001 µg/L	---	0.1	76.9	34.4	150
	0.010 µg/L	<0.010	---	---	---	---
Total Chlordane (sum)	0.010 µg/L	<0.010	---	---	---	---
trans-Chlordane	0.001 µg/L	---	0.1	96.3	45.1	140
	0.010 µg/L	<0.010	---	---	---	---

Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.*

* Indicates failed QC

Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
Analyte name	**Laboratory Sample ID**	**Client Sample ID**	**LOR**	**Spike Concentration**				
EP130A: Organophosphorus Pesticides (Ultra-trace)								
EP130A: Organophosphorus Pesticides (Ultra-trace) - (QC Lot: 360516)				µg/L	µg/L	%	%	%
Bromophos-ethyl	EP0700712-002	MB02	0.10 µg/L	1.0	<0.10	94.1	70	130
Carbophenothion			0.10 µg/L	1.0	<0.10	97.8	70	130
Chlorfenvinphos (Z)			0.10 µg/L	0.9	<0.10	95.2	70	130
Chlorpyrifos			0.05 µg/L	1.0	<0.050	60.7	70	130
Chlorpyrifos-methyl			0.10 µg/L	1.0	<0.10	51.9	70	130
Demeton-S-methyl			0.10 µg/L	1.0	<0.10	36.6	70	130
Diazinon			0.10 µg/L	1.0	<0.10	59.1	70	130
Dichlorvos			0.10 µg/L	1.0	<0.10	46.4	70	130
Dimethoate			0.10 µg/L	1.0	<0.10	48.3	70	130
Ethion			0.10 µg/L	1.0	<0.10	113	70	130
Fenamiphos			0.10 µg/L	1.0	<0.10	115	70	130
Fenthion			0.10 µg/L	1.0	<0.10	54.9	70	130
Malathion			0.10 µg/L	1.0	<0.10	61.2	70	130
Methyl Azinphos			0.10 µg/L	1.0	<0.10	63.5	70	130
Monocrotophos			0.10 µg/L	1.0	<0.10	12.1	70	130
Parathion			0.10 µg/L	1.0	<0.10	52.8	70	130
Parathion-methyl			0.10 µg/L	1.0	<0.10	40.6	70	130
Pirimphos-ethyl			0.10 µg/L	1.0	<0.10	65.2	70	130
Prothiofos			0.10 µg/L	1.0	<0.10	93.1	70	130
EP131A: Organochlorine Pesticides								
EP131A: Organochlorine Pesticides - (QC Lot: 360515)				µg/L	µg/L	%	%	%
Aldrin	EP0700712-002	MB02	0.01 µg/L	0.1	<0.010	100	70	130
alpha-BHC			0.01 µg/L	0.1	<0.010	114	70	130
beta-BHC			0.01 µg/L	0.1	<0.010	109	70	130
delta-BHC			0.01 µg/L	0.1	<0.010	107	70	130

Matrix Type: WATER

Matrix Spike (MS) Report

Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results: Sample Result	Actual Results: Spike Recovery MS	Recovery Limits: Static Limits Low	Recovery Limits: Static Limits High
EP131A: Organochlorine Pesticides - continued								
EP131A: Organochlorine Pesticides - (QC Lot: 360515) - continued				µg/L	µg/L	%	%	%
4,4'-DDD	EP0700712-002	MB02	0.01 µg/L	0.1	<0.010	107	70	130
4,4'-DDE			0.01 µg/L	0.1	<0.010	102	70	130
4,4'-DDT			0.01 µg/L	0.1	<0.010	116	70	130
Dieldrin			0.01 µg/L	0.1	<0.010	112	70	130
alpha-Endosulfan			0.01 µg/L	0.1	<0.010	109	70	130
beta-Endosulfan			0.01 µg/L	0.1	<0.010	118	70	130
Endosulfan sulfate			0.01 µg/L	0.1	<0.010	121	70	130
Endrin			0.01 µg/L	0.1	<0.010	124	70	130
Endrin aldehyde			0.01 µg/L	0.1	<0.010	87.8	70	130
Endrin ketone			0.01 µg/L	0.1	<0.010	113	70	130
Heptachlor			0.005 µg/L	0.1	<0.005	116	70	130
Heptachlor epoxide			0.01 µg/L	0.1	<0.010	119	70	130
Hexachlorobenzene (HCB)			0.01 µg/L	0.1	<0.010	85.3	70	130
gamma-BHC			0.01 µg/L	0.1	<0.010	108	70	130
Methoxychlor			0.01 µg/L	0.1	<0.010	118	70	130
cis-Chlordane			0.01 µg/L	0.1	<0.010	104	70	130
trans-Chlordane			0.01 µg/L	0.1	<0.010	104	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**BROWN GEOTECHNICAL AND ENVIRONMENTAL**	**Laboratory**	:	Environmental Division Perth	**Page**	: 1 of 5
Contact	:	GINA PEMBERTON	**Contact**	:	Shaun Crabb		
Address	:	SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	**Address**	:	10 Hod Way Malaga WA Australia 6090	**Work order**	: **EP0700712**
						Amendment No.	:
Project	:	J06062	**Quote number**	:	PEN-063-06	**Date received**	: 22 Feb 2007
Order number	:	- Not provided -				**Date issued**	: 8 Mar 2007
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	ginapemberton@acidss.com.au	**E-mail**	:	Shaun.Crabb@alsenviro.com	**No. of samples**	
Telephone	:	08 9368 2615	**Telephone**	:	61-8-9209 7655	**Received**	: 4
Facsimile	:	- Not provided -	**Facsimile**	:	61-8-9209 7600	**Analysed**	: 4

This Interpretive Quality Control Report was issued on 8 Mar 2007 for the ALS work order reference EP0700712 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Analysis Holding Time and Preservation

Matrix Type: WATER

Method / Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP130: Organophosphorus Pesticides (Ultra-trace)							
Amber Glass Bottle - Unpreserved							
MB01, MB02, MB03, QA1	**20 Feb 2007**	**26 Feb 2007**	27 Feb 2007	Pass	**28 Feb 2007**	7 Apr 2007	Pass
EP131A: Organochlorine Pesticides (Ultra-trace)							
Amber Glass Bottle - Unpreserved							
MB01, MB02, MB03, QA1	**20 Feb 2007**	**26 Feb 2007**	27 Feb 2007	Pass	**28 Feb 2007**	7 Apr 2007	Pass

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Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Frequency of Quality Control Samples

Matrix Type: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP130: Organophosphorus Pesticides (Ultra-trace)	1	4	25.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP131A: Organochlorine Pesticides (Ultra-trace)	1	5	20.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP130: Organophosphorus Pesticides (Ultra-trace)	1	4	25.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP131A: Organochlorine Pesticides (Ultra-trace)	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP130: Organophosphorus Pesticides (Ultra-trace)	1	4	25.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP131A: Organochlorine Pesticides (Ultra-trace)	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP130: Organophosphorus Pesticides (Ultra-trace)	1	4	25.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP131A: Organochlorine Pesticides (Ultra-trace)	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Matrix Spikes (MS)							
EP130A: Organophosphorus Pesticides (Ultra-trace)	WATER	EP0700712-002	MB02	Chlorpyrifos	60.7 %	70-130 %	Recovery less than lower data quality objective
				Chlorpyrifos-methyl	51.9 %	70-130 %	Recovery less than lower data quality objective
				Demeton-S-methyl	36.6 %	70-130 %	Recovery less than lower data quality objective
				Diazinon	59.1 %	70-130 %	Recovery less than lower data quality objective
				Dichlorvos	46.4 %	70-130 %	Recovery less than lower data quality objective
				Dimethoate	48.3 %	70-130 %	Recovery less than lower data quality objective
				Fenthion	54.9 %	70-130 %	Recovery less than lower data quality objective
				Malathion	61.2 %	70-130 %	Recovery less than lower data quality objective
				Methyl Azinphos	63.5 %	70-130 %	Recovery less than lower data quality objective
				Monocrotophos	12.1 %	70-130 %	Recovery less than lower data quality objective
				Parathion	52.8 %	70-130 %	Recovery less than lower data quality objective
				Parathion-methyl	40.6 %	70-130 %	Recovery less than lower data quality objective
				Pirimphos-ethyl	65.2 %	70-130 %	Recovery less than lower data quality objective

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: WATER

Method Reference Summary

Preparation Methods

ORG14-UTP : Sep. Funnel Extraction of Liquids (Ultra-trace pesticides.) - USEPA 3510 Samples are extracted into dichloromethane, concentrated and exchanged into an apporpriate solvent for GPC and florisil cleanup as required. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EP130 : Organophosphorus Pesticides (Ultra-trace) - USEPA Method 3640 (GPC cleanup), 8141 (GC/FPD - Capillary Column) This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP131A : Organochlorine Pesticides (Ultra-trace) - USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/uECD/uECD). This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

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CERTIFICATE OF ANALYSIS

Client	: BROWN GEOTECHNICAL AND ENVIRONMENTAL	*Laboratory*	: Environmental Division Perth	*Page*	: 1 of 4
Contact	: MS GINA PEMBERTON	*Contact*	: Shaun Crabb	*Work Order*	: EP0700713
Address	: SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	*Address*	: 10 Hod Way Malaga WA Australia 6090		
E-mail	: ginapemberton@acidss.com.au	*E-mail*	: Shaun.Crabb@alsenviro.com		
Telephone	: 08 9368 2615	*Telephone*	: 61-8-9209 7655		
Facsimile	: - Not provided -	*Facsimile*	: 61-8-9209 7600		
Project	: J06062	*Quote number*	: PEN-063-06	*Date received*	: 22 Feb 2007
Order number	: - Not provided -			*Date issued*	: 28 Feb 2007
C-O-C number	: - Not provided -			*No. of samples*	- *Received* : 4
Site	: - Not provided -				*Analysed* : 4

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NATA Accredited Laboratory 825

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Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*
Celine Conceicao	Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference EP0700713 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

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Analytical Results

	Client Sample ID :	MB01	MB02	MB03	QA1	
	Sample Matrix Type / Description :	WATER	WATER	WATER	WATER	
	Sample Date / Time :	20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	20 Feb 2007 15:00	
	Laboratory Sample ID :	EP0700713-001	EP0700713-002	EP0700713-003	EP0700713-004	
Analyte	CAS number	LOR	Units			
EG020T: Total Metals by ICP-MS						
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	0.0008	<0.0001	<0.0001	0.0007	
Chromium	7440-47-3	0.001	mg/L	0.010	0.007	0.004	0.009	
Copper	7440-50-8	0.001	mg/L	0.130	0.034	0.016	0.126	
Lead	7439-92-1	0.001	mg/L	0.176	0.020	0.017	0.129	
Nickel	7440-02-0	0.001	mg/L	0.078	0.018	0.004	0.074	
Zinc	7440-66-6	0.005	mg/L	0.105	0.055	0.013	0.099	
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	0.0001	<0.0001	0.0001	0.0001	

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Surrogate Control Limits

- **No surrogates present on this report.**

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QUALITY CONTROL REPORT

Client	:	**BROWN GEOTECHNICAL AND ENVIRO**	**Laboratory**	: Environmental Division Perth	**Page**	:	1 of 4
Contact	:	GINA PEMBERTON	**Contact**	: Shaun Crabb			
Address	:	SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	**Address**	: 10 Hod Way Malaga WA Australia 6090	**Work order**	:	**EP0700713**
					Amendment No.	:	
Project	:	J06062	**Quote number**	: PEN-063-06	**Date received**	:	22 Feb 2007
Order number	:	- Not provided -			**Date issued**	:	28 Feb 2007
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	ginapemberton@acidss.com.au	**E-mail**	: Shaun.Crabb@alsenviro.com	**No. of samples**		
Telephone	:	08 9368 2615	**Telephone**	: 61-8-9209 7655	**Received**	:	4
Facsimile	:	- Not provided -	**Facsimile**	: 61-8-9209 7600	**Analysed**	:	4

This final report for the ALSE work order reference EP0700713 supersedes any previous reports with this reference.
Results apply to the samples as submitted. All pages of this report have been checked and approved for release.
This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

ALSE - Excellence in Analytical Testing

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory - 825

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

Accredited for compliance with ISO/IED 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Department
Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.*
* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Laboratory Duplicates (DUP) Report

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 361149)				mg/L	mg/L	%
EP0700701-002	Anonymous	Arsenic	0.001 mg/L	0.002	0.002	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	0.002	0.003	0.0
		Lead	0.001 mg/L	0.002	0.002	0.0
		Nickel	0.001 mg/L	0.001	0.001	0.0
		Zinc	0.005 mg/L	0.168	0.170	1.2
ES0702315-002	Anonymous	Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Cadmium	0.0001 mg/L	0.0004	0.0002	47.9
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	0.003	0.003	0.0
		Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	<0.001	0.002	0.0
		Zinc	0.005 mg/L	0.013	0.014	9.4
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 360655)				mg/L	mg/L	%
EP0700703-006	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
ES0702267-005	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0

ALS Environmental

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 361149)		mg/L	mg/L	%	%	%
Arsenic	0.001 mg/L	—	0.1	87.0	78.7	111
	0.001 mg/L	<0.001	—	—	—	—
Cadmium	0.0001 mg/L	—	0.1	93.7	79.3	111
	0.0001 mg/L	<0.0001	—	—	—	—
Chromium	0.001 mg/L	—	0.1	91.9	83.4	114
	0.001 mg/L	<0.001	—	—	—	—
Copper	0.001 mg/L	—	0.1	87.1	80.1	118
	0.001 mg/L	<0.001	—	—	—	—
Lead	0.001 mg/L	—	0.1	91.0	83.2	116
	0.001 mg/L	<0.001	—	—	—	—
Nickel	0.001 mg/L	—	0.1	85.1	84.3	115
	0.001 mg/L	<0.001	—	—	—	—
Zinc	0.005 mg/L	—	0.1	86.1	77.2	109
	0.005 mg/L	<0.005	—	—	—	—
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 360655)		mg/L	mg/L	%	%	%
Mercury	0.0001 mg/L	—	0.010	95.0	78.6	118
	0.0001 mg/L	<0.0001	—	—	—	—

ALS Environmental

Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. *Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.*

* Indicates failed QC

Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration		MS	Low	High
EG020T: Total Metals by ICP-MS								
EG020T: Total Metals by ICP-MS - (QC Lot: 361149)				mg/L	mg/L	%	%	%
Arsenic	EP0700701-003	Anonymous	0.001 mg/L	1	<0.001	89.5	70	130
Cadmium			0.0001 mg/L	0.25	0.0005	97.4	70	130
Chromium			0.001 mg/L	1	0.001	89.9	70	130
Copper			0.001 mg/L	1	<0.001	84.8	70	130
Lead			0.001 mg/L	1	<0.001	90.9	70	130
Nickel			0.001 mg/L	1	<0.001	82.2	70	130
Zinc			0.005 mg/L	1	<0.005	86.4	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 360655)				mg/L	mg/L	%	%	%
Mercury	EP0700703-006	Anonymous	0.0001 mg/L	0.010	<0.0001	94.3	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**BROWN GEOTECHNICAL AND ENVIRONMENTAL**	**Laboratory**	:	Environmental Division Perth	**Page**	: 1 of 5
Contact	:	GINA PEMBERTON	**Contact**	:	Shaun Crabb		
Address	:	SUITE 4 / 47 MONASH AVENUE COMO WA AUSTRALIA 6152	**Address**	:	10 Hod Way Malaga WA Australia 6090	**Work order**	: **EP0700713**
						Amendment No.	:
Project	:	J06062	**Quote number**	:	PEN-063-06	**Date received**	: 22 Feb 2007
Order number	:	- Not provided -				**Date issued**	: 28 Feb 2007
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	ginapemberton@acidss.com.au	**E-mail**	:	Shaun.Crabb@alsenviro.com	**No. of samples**	
Telephone	:	08 9368 2615	**Telephone**	:	61-8-9209 7655	**Received**	: 4
Facsimile	:	- Not provided -	**Facsimile**	:	61-8-9209 7600	**Analysed**	: 4

This Interpretive Quality Control Report was issued on 28 Feb 2007 for the ALS work order reference EP0700713 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Analysis Holding Time and Preservation

Matrix Type: WATER

Method / Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG020A-T: Total Metals by ICP-MS - Suite A							
Clear Plastic Bottle - Unfiltered; Lab-acidified MB01, MB02, MB03, QA1	**20 Feb 2007**	**26 Feb 2007**	19 Aug 2007	Pass	**26 Feb 2007**	19 Aug 2007	Pass
EG035T: Total Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified MB01, MB02, MB03, QA1	**20 Feb 2007**	—	—	—	**28 Feb 2007**	20 Mar 2007	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER

Frequency of Quality Control Samples

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EG020A-T: Total Metals by ICP-MS - Suite A	2	20	10.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	18	11.1	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	18	5.6	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	18	5.6	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	18	5.6	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: WATER

Preparation Methods

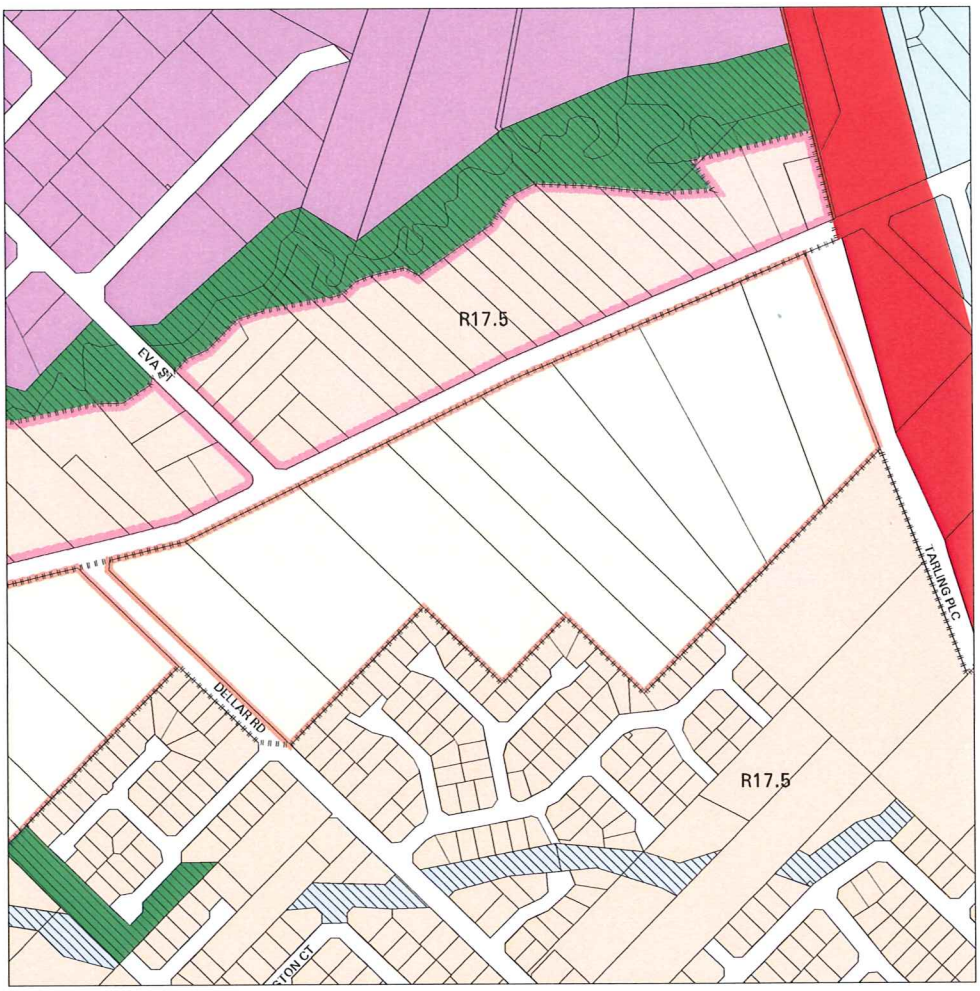
EN25 : Digestion for Total Recoverable Metals - USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods

EG020A-T : Total Metals by ICP-MS - Suite A - (APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

EG035T : Total Mercury by FIMS - AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

APPENDIX E
ZONING EXTRACT



LEGEND

MRS Reserves

- Primary Regional Roads

Local Scheme Reserves

- Local Open Space
- Water Courses

Other

- R20 — R Codes

Zones

- Composite Residential/light industry
- Residential
- Residential Development
- general Industry
- General rural

burgess design group	DRAWING NUMBER: GRE MAD-7-01 DATE: 26.02.2009		EXTRACT OF LOCAL TOWN PLANNING SCHEME No 6
	351 Newcastle Street, Northbridge W.A. 6003 ph: (08) 9328 6411 www.burgessdesigngroup.com.au	SOURCE: CITY OF GOSNELLS	LOT 5, 6, & 144 MADDINGTON ROAD, CITY OF GOSNELLS

APPENDIX F

PROPOSED OUTLINE DEVELOPMENT PLAN

LEGEND

- ODP Boundary
- Public Open Space
- DAP Required
- 20 Code
- R25 Code
- R30 Code
- R40 Code
- Dedicated Drainage

'MADDINGTON ROAD PRECINCT A' OUTLINE DEVELOPMENT PLAN

LOTS 412-414, 5-6, 125-126, 2 & 103 MADDINGTON ROAD

MADDINGTON

CITY OF GOSNELLS

burgess design group
TOWN PLANNING + URBAN DESIGN

NORTH

Plan No: GRE MAD-2-11d Client: GREYSTONE DEVELOPMENTS
Date: 11.02.11 Planner: RVS

APPENDIX G
SERVICING REPORT

DEVELOPMENT
ENGINEERING
CONSULTANTS

Our Ref: Lots 5, 6 & 414 Maddington Rd Servicing Report 071105.doc
5th November 2007

Burgess Design Group
351 Newcastle Street
NORTHBRIDGE WA 6003
(PO Box 374 NORTHBRIDGE WA 6865)

Attention: Mr Vasko Spaseski - Senior Urban Designer

LOTS 5, 6 & 414 MADDINGTON ROAD – MADDINGTON
ENGINEERING SERVICES REPORT

This report describes the engineering services – including roads, water, underground power, telecommunications, sewerage and site drainage that are available &/or required to enable urban development to occur over lots 5, 6 & 414 Maddington Road, in Maddington.

Site

Lots 5, 6 & 414 are located approximately 100 meters east of the intersection of Eva Street and Maddington Road within the suburb of Maddington. The proposed development consists of ~97 lots and is effectively the northern extension of the existing Gosnells City Council "Dellar Road" development which abuts the southern boundary of each of these three lots. The land is partly cleared and has been used for general rural homestead purposes for many years.

The elevation of the land varies from RL 19.0 (on the eastern boundary of lot 5) to RL 17.0 (near the north-western corner of lot 414 – closest to Maddington Road). During heavy rainfall, the land is affected by perched water table, which produces over-land flow in a south-easterly direction.

Fill

The geotechnical site investigation completed over the site by Brown Geotechnical & Environmental (Ref: Report J06062.01 – March 2007) has indicated that a minimum of 0.5m of clean sand fill will be needed over the site in order to achieve a site Class "S" classification provided an "off-site" drainage solution is utilized i.e.(no soak wells are used & roof runoff collected into rainwater tanks &/or via a direct connection of roof/property runoff to the proposed road drainage network) – otherwise up to 1.5m of clean sand fill may be required if standard household "on-site" soak wells were to be utilized.

Roads

The land is readily accessible from Maddington Road. All road design / construction will be to WAPC and Local Authority standards. All internal roads within the development to be designed for local traffic using 6 meter wide carriageways, while Maddington Road is expected to be a 7.4-7.5 meter wide carriageway.

Power

Power is available from several locations around the site - via an existing aerial supply in Maddington Road and an underground power supply would be installed through the estate to link directly in to the existing Coorain Street underground power network (at the rear of lot 5). It is anticipated that the estate will require transformer &/or switch gear sites to be provided at suitable locations within the proposed development.

Telephone & Gas

Existing Telstra and gas services are available in the area, and can be easily extended into the proposed development without any significant upgrading by each respective service authority.

DEVELOPMENT
ENGINEERING
CONSULTANTS

Water Supply

The site can be adequately supplied with water by linking with the existing residential system to the south and industrial development to the north of the subject land.

Discussions with Water Corporation's project officer has revealed that the subject land could be readily serviced by installing a 150mm dia. line through lot 5 to provide a link from the existing 400mm dia. steel main in Maddington Road to the existing 150mm dia. mains in Coorain Street. The Water Corporation currently has some minor concerns with pressure levels in the area and has also indicated that this would be readily alleviated by extending the existing 250mm dia. main in Dellar Road (near the intersection of Winterbourne Glade) to the existing 400mm dia. steel main in Maddington Road.

Sewers

Discussions with Water Corporation's project officer has also confirmed that site is capable of being adequately supplied with reticulated sewers (under their current planning) by simply extending the existing deep sewer line in the rear of Pt. lot 412 eastwards along the rear of adjoining lot 413 into lot 414. This sewer extension is in fact essential to enable land to the east of lot 5 (up to the western boundary of Tonkin Highway) to be provided with a suitable gravity sewer connection point.

Refer to copy attached Water Corporation planning map.

Drainage

A Drainage Management Plan (DMP) may be required as part of this development as it is anticipated that the following elements will need to be included in the subdivision stormwater drainage system for lots 5, 6 & 414 Maddington Road:

- The natural fall across the estate will probably need to be retained and all lots will need to be filled so their finished levels comprise at least 0.5m of clean sand fill (on average) on top of the existing 0.4 to 0.6m sandy-clay layer. It is also expected that his existing sandy-clay layer will need to be re-graded to direct all infiltrated water towards the front portion of each lot.
- Sub-soil drainage lines (in conjunction with sewer lines bedded on crushed metal) will be installed within on either side of each subdivision road reserve. This dual network will help maintain groundwater levels at or at least very close to the original "in-situ" soil layer and also assist with the removal of any excess groundwater build-up during prolonged wet periods. This system will effectively ensure that at least a maximum separation of ~60m is obtained between each installed sub-soil line within the development.
- All intercepted groundwater, stormwater run-off from the subdivision roads plus any run-off from lots will be directed into a suitably sized basin / swale - probably adjacent to Maddington Road near the north-western corner of lot 414. Some minor run-off will also be directed into the existing Maddington Road table drain - which may also need to be adjusted slightly to protect existing vegetation &/or to improve overall safety / amenity of the area. Wherever possible / appropriate, water sensitive design elements will be included in the drainage solution - which will hopefully involve the use of "on-site" rainwater tanks to capture & re-use roof run-off.

  Note: Subject to detailed design, some extra sub-soil drainage may need to be installed in the rear of some lots to help control any possible rise in water table levels (in "difficult" areas), and some house sites may also need to be connected directly to the road /subsoil drainage system.

Please do not hesitate to call me at any time if you have any queries regarding this servicing report.

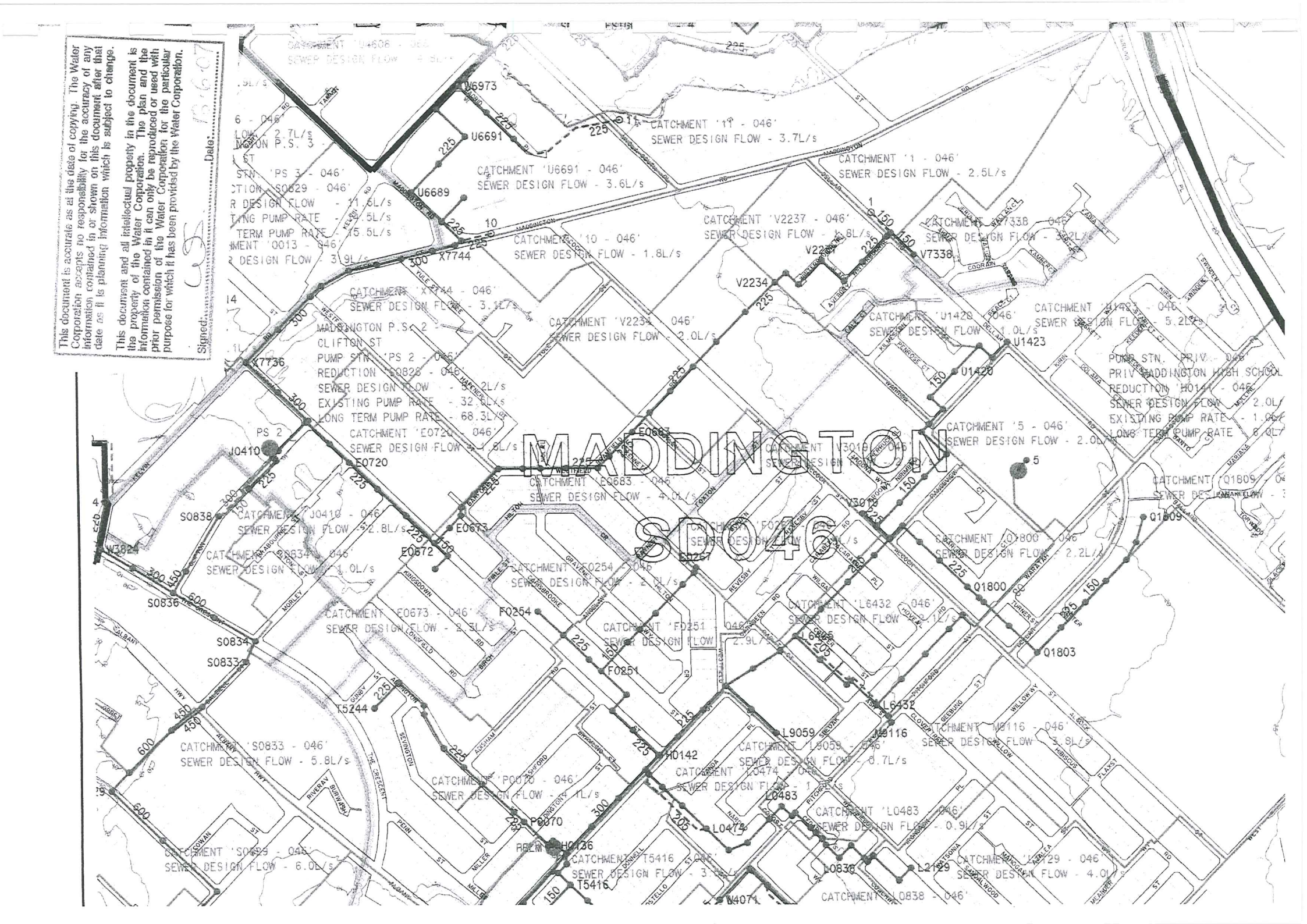
Yours faithfully,
DEVELOPMENT ENGINEERING CONSULTANTS PTY LTD

R. D. Graieg.

ROBERT D. GRAIEG - PRINCIPAL CIVIL ENGINEER

APPENDIX

1. WATER CORPORATION SEWER PLANNING
2. EXISTING WATER AND SEWER
3. EXISTING COUNCIL STORMWATER DRAINAGE
   (3 SEPARATE SHEETS)



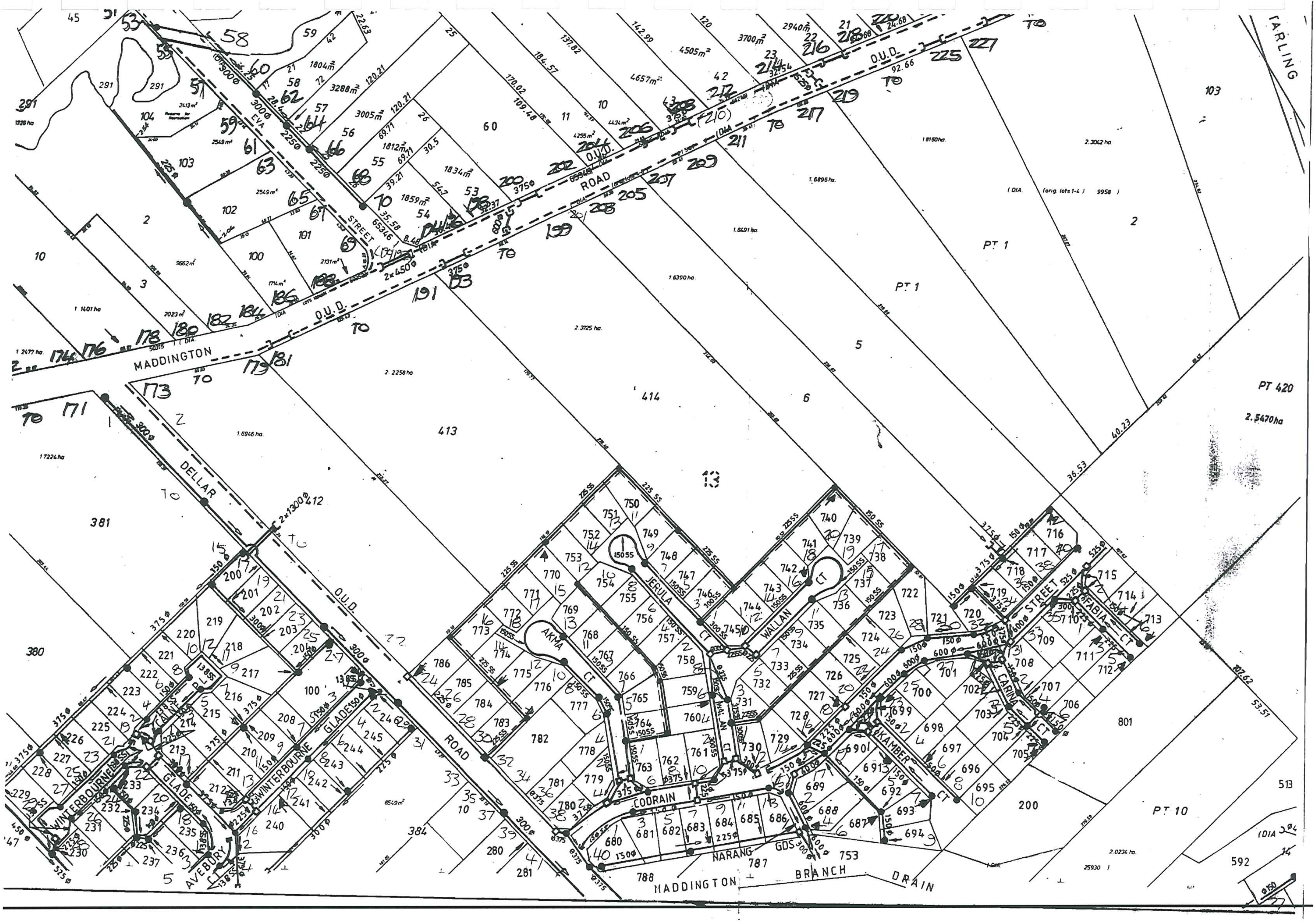
MADDINGTON
RD
HWY
PL
ST
TARLING
ENLARGEMENT
FILL TO RL 17.00 (MIN)
IF LOT IS TO BE SERVED
BY PROPERTY SEWER
NO JUNCTION PROVIDED.
REFER FILE CV1 2002 00933
Height Datum : AHD Coordinate System : MGA94
The Water Corporation has taken due care in the preparation of this data, but accepts no responsibility for any inaccuracy of facility, cadastral or contour information provided, nor inappropriate use of this information. If any inaccuracy is found with the facility information, please contact Facilities Mapping Information Section on (08) 9420 2068. If any inaccuracy is found with the cadastral or contour information, please contact DOLA to request source data.
6454245
PERTH BG34 2215 Screen 3/12/05

CITY OF GOSNELLS

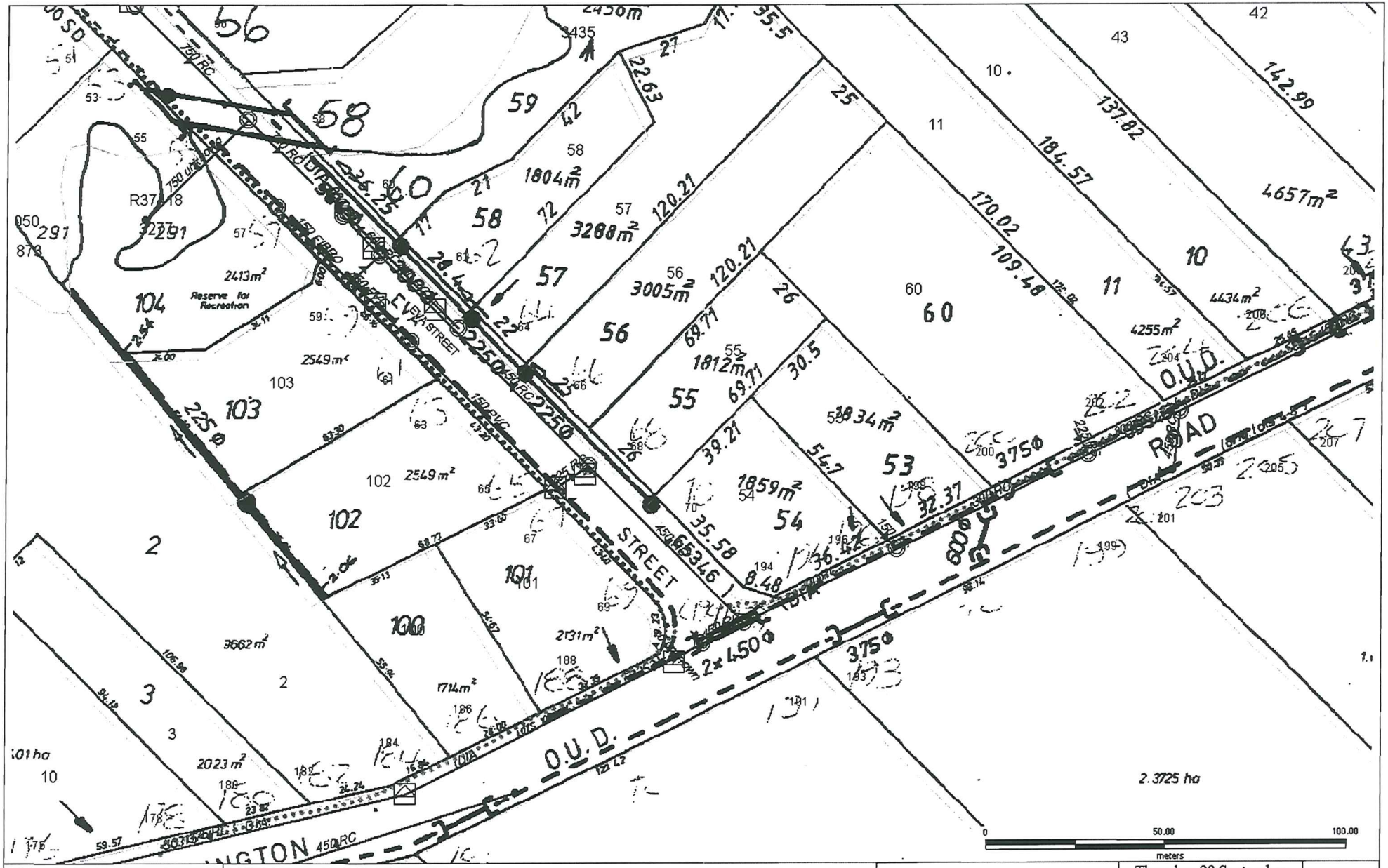
The City of Gosnells provides the information contained herein. The Council of the City of Gosnells shall not be liable for any loss or damage howsoever caused as a result of reliance upon information contained in these documents.

Thursday, 28 September 2006

N



TARLING
PT 420
PT 10
PT 1
MADDINGTON ROAD
DELLAR ROAD
EVA STREET
WALLAN CT
JERULA CT
AKMA CT
COORAIN
NARANG GDS
KAMBER CT
CARINA CT
FABIA CT
GLADE
WINTERBOURNE
AVEBURY CT
MADDINGTON BRANCH DRAIN
O.U.D.



Thursday, 28 September 2006