WASTE MANAGEMENT PLAN

Waste Disposal Facility Expansion, 'Yeronga'

November 2019

Project Number: 19-172

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W. www.nghconsulting.com.au

E. ngh@nghconsulting.com.au

BEGA - ACT & SOUTH EAST NSW
Suite 11, 89-91 Auckland Street (PO Box 470) Bega NSW 2550 **T.** (02) 6492 8333

NEWCASTLE - HUNTER & NORTH COAST
Unit 2, 54 Hudson Street
Hamilton NSW 2303 **T.** (02) 4929 2301

BRISBANE
Suite 4, Level 5, 87 Wickham Terrace
Spring Hill QLD 4000 **T.** (07) 3129 7633

SYDNEY REGION
Unit 18, Level 3, 21 Mary Street
Surry Hills NSW 2010 **T.** (02) 8202 8333

CANBERRA - NSW SE & ACT
8/27 Yallourn Street (PO Box 62)
Fyshwick ACT 2609 **T.** (02) 6280 5053

WAGGA WAGGA - RIVERINA & WESTERN NSW
Suite 1, 39 Fitzmaurice Street (PO Box 5464)
Wagga Wagga NSW 2650 **T.** (02) 6971 9696

GOLD COAST
PO Box 466
Tugun QLD 4224 **T.** (07) 3129 7633

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GLOSSARY

Biosecurity Act	*Biosecurity Act 2015*
BOD	Biochemical oxygen demand: a measure of the amount of oxygen required by microorganisms to degrade organic matter present in a water sample under standard test conditions.
BOM	Australian Bureau of Meteorology
Construction and demolition waste	any waste that is classified or assessed as construction and demolition waste in accordance with the Waste Classification Guidelines (NSW EPA, 2014).
Capping	the covering that is applied to the waste to rehabilitate the landfill once it has reached its maximum height. Final capping in a traditional barrier cap usually comprises several layers, depending on the design (from bottom to top): a seal-bearing surface, a gas drainage layer, a sealing layer, an infiltration drainage layer, and a revegetation layer.
Cell	a discrete unit of a landfill that is physically separated from other waste emplacements at the site.
CLM Act	*Contaminated Land Management Act 1997*
CLM Amendment Act	Contaminated Land Management Amendment Act 2008
Commercial/industrial waste	Waste derived from commercial and industrial activities
Yeronga Landfill	All land and activities occurring within the premises regulated under EPL No. 13222.
Cwth	Commonwealth
EPA	Environmental Protection Authority of NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Cwth)*
EPL	Environmental Protection Licence
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
ESD	Ecologically Sustainable Development
ha	hectares
General solid waste	any waste that is classified or assessed as general solid waste in accordance with the Waste Classification Guidelines (NSW EPA, 2014). The definition further breaks the waste up into putrescible and non-putrescible components.
Hazardous waste	any waste that is classified as hazardous in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Hazardous waste cannot be

	disposed of to landfill unless it is treated to remove or immobilise the contaminants.
Special waste	any waste that is classified as 'special waste' in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Special waste cannot be disposed of to landfill unless specifically stated under licence conditions issues under the POEO Act.
HOPE	High density polyethylene plastic
ISEPP	State Environmental Planning Policy (Infrastructure) 2007 (NSW)
km	kilometres
Landfill	An engineered, in-ground facility for the safe and secure disposal of society's wastes.
Landfill gas	Gaseous emissions resulting from the decomposition of organic matter within the landfill. The gas typically comprises 60% methane and 40% carbon dioxide
Leachate	Water that has percolated/migrated through landfilled waste and generally contains contaminants absorbed from the waste material.
LEMP	Landfill Environmental Management Plan
LGA	Local government area
m	metres
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
POEO Act	*Protection of the Environment Operations Act 1997 (NSW)*
PET	Polyethylene terephthalate plastic, such as for drink bottles
Runoff	the portion of water falling on an area (either precipitation or irrigation water) that drains from the area as surface flow.
Scavenging	Recovery of waste materials from the active tipping face of the waste depot
Sensitive receptors	Environments that could be affected by pollution from the landfill. Typically, this includes locations close to the landfill where people work or reside, such as a dwellings, schools, hospitals, offices or public recreational areas. It can also include water bodies such as groundwater resources, drinking water catchments and sensitive wetlands.
SEPP	State Environmental Planning Policy (NSW)
Shire	Bland Shire Council
sp/spp	Species/multiple species

1. INTRODUCTION

1.1. BACKGROUND

NGH was engaged by Mr. C. Burns to prepare a Waste Management Plan (WMP) in relation to an existing waste disposal facility at 'Yeronga', Euroka Road, Quandialla. The subject land includes Lots 1 & 2, DP1039488.

The WMP was prepared to support a modified consent application, under clause 4.55(1)(A) of the *Environmental Planning & Assessment Act 1979,* submitted to Bland Shire Council. The application relates to the modification of the current development approval DA/2007/083 issued by Bland Shire Council. The proposed modification seeks approval to change the volume of waste disposed of at the facility from 10,000 tonnes to 18,000 tonnes per annum. The modification also involves a variation to Environmental Protection Licence (EPL) No. 13222 under the *Protection of the Environment Operations Act 1997* (POEO Act).

The existing and future operation of the Yeronga Landfill would fall within the definition of a General Solid Waste Landfill (non-putrescible waste) and Special Waste Landfill (waste tyres). The proposed modification also seeks to more accurately describe the types of non-putrescible waste acceptable at the site.

It is intended this WMP would provide additional information necessary to assist Bland Shire Council and the Environment Protection Agency (EPA) to finalise the assessment and determination of the modification application MA2015/0009.

1.2. SCOPE OF THE REPORT

The purpose of this WMP is to describe the principles, procedures and management of the waste received at the facility. The WMP includes the variations to EPL No. 13222. NGH has prepared this WMP on behalf of the proponent, to ensure legal obligations are addressed and maintained in the management of all waste streams received at the site.

To support the proposed modification of the current development approval, this WMP outlines measures to manage waste disposal during operation of the proposed facility. The WMP includes details on:

- The types and quantities of waste to be received at the facility.
- Measures to dispose of and manage waste at the development.
- Management of environmental impacts.
- Landfill operations and design including fill, cover, capping and rehabilitation.
- Monitoring and compliance with EPL No. 13222 (Appendix A).
- A program for recording and monitoring the effectiveness of waste disposal measures and management of environmental impacts (Appendix B).

The WMP is designed to comply with all relevant legislation and guidelines detailed in section 3 and is underpinned by adaptive management principles.

2. PROJECT DESCRIPTION

2.1. PROPOSAL SITE

The subject land is described as Lot 1 and 2 DP1039488, comprising a total of 425 hectares as shown in Figure 2-1. The property is known as 'Yeronga' located at Euroka Road in the locality of Quandialla. The subject land is approximately 13km south of Quandialla.

The site is set among agricultural land and zoned RU1 Primary Production under the Bland Local Environmental Plan 2011. Surrounding land is actively used for road transport, cropping and grazing.

Yeronga Landfill is located on former farmland. The site has filled waste cells, quarry voids, a dwelling, office, sheds, machinery and shipping containers. Prior streams excavated for construction sand have created long voids of variable width and depth (Figure 2-2). The voids that have been previously excavated have been lined with compacted in situ soils (Figure 2-3), backfilled with building and demolition waste and waste tyres (Figure 2-4). Filled cells have then been capped with material from the site (Figure 2-5).

2.2. OUTLINE

The existing development on the site is defined as a general solid waste landfill. It holds approval to accept up to 10,000 tonnes per annum of non-putrescible waste and special waste (waste tyres only). The private operator of the Yeronga Landfill is Craig William Burns of Traction Tyre Disposal and Recycling Pty Ltd (herein referred to as the 'licensee').

The proposed modified consent application relates to the modification of the current development approval DA/2007/083 issued by Bland Shire Council. The proposed modification seeks approval to increase the volume of waste disposed of at the facility from 10,000 tonnes to 18,000 tonnes per annum. The current quarry void locations are shown in Figure 2-6 on the following pages.

Adjacent to the quarry voids are additional sand resources that are subject to ongoing quarrying. In addition, the virgin excavated natural material (VENM) used for clean cover is won from the site. The won material is taken from areas within and adjacent to the quarry voids. Voids created by ongoing sand extraction and winning of VENM are will be used for landfilling.

The existing and future operation of the Yeronga Landfill would fall within the definition of a General Solid Waste Landfill (non-putrescible waste) and Special Waste Landfill (waste tyres). The proposed modification also seeks to more accurately describe the types of non-putrescible waste acceptable at the site.

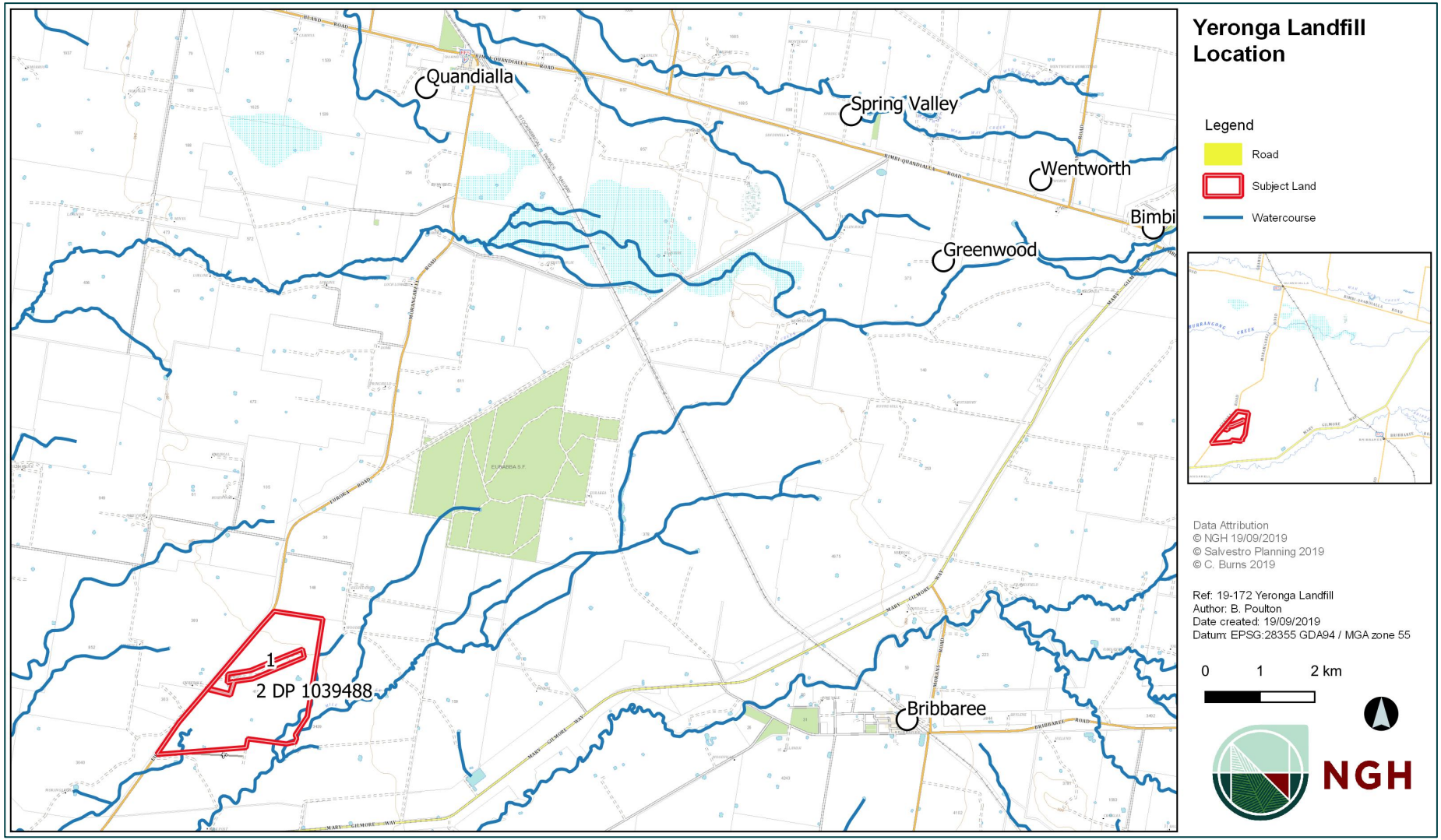

Figure 2-1 Location of the Yeronga Landfill

Figure 2-2 Quarry void along past stream.

Figure 2-3 Excavated waste cell.

Figure 2-4 Shredded tyres for disposal.

Figure 2-5 Filled and capped waste cell.

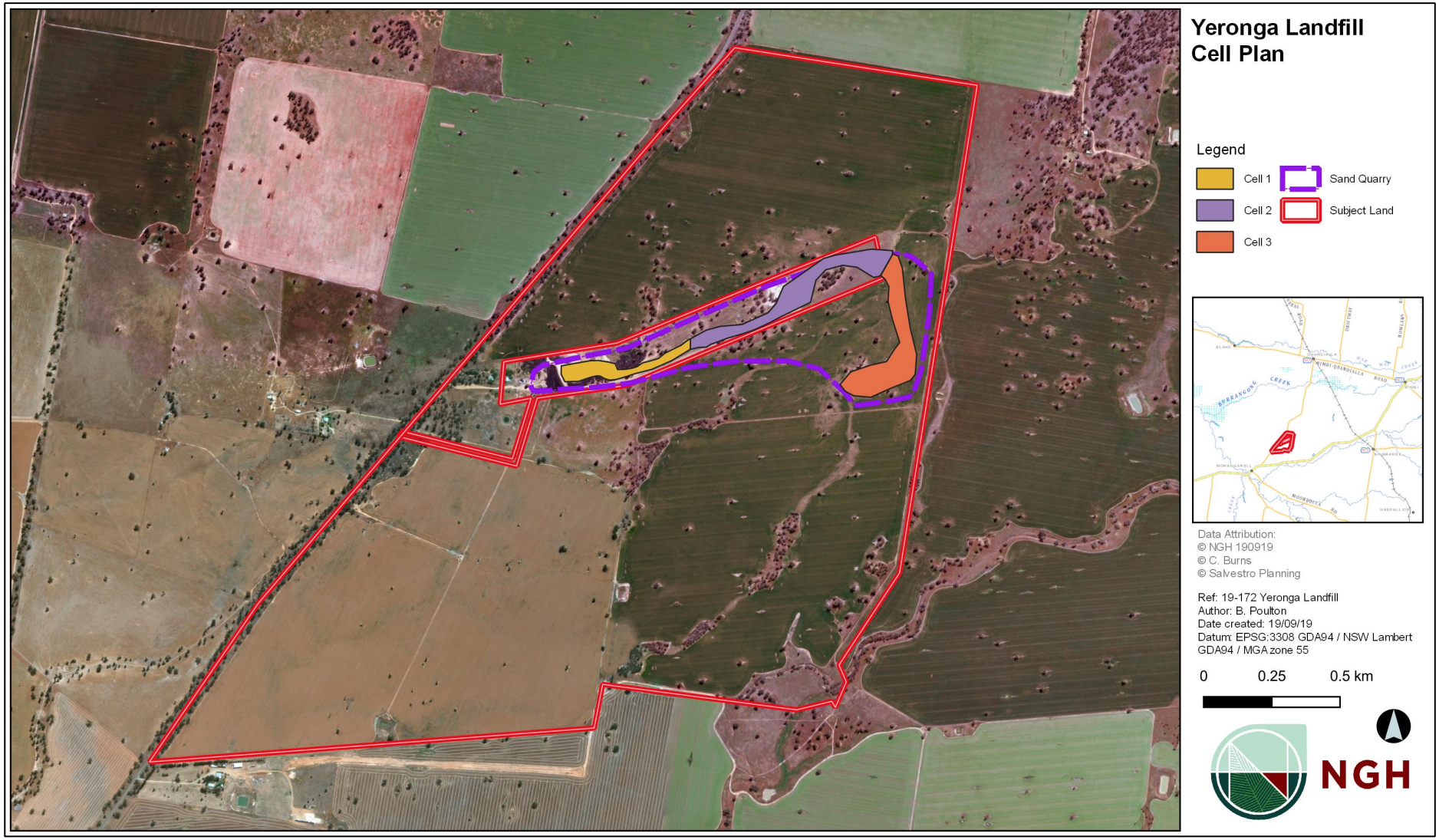

Figure 2-6 Existing quarry void locations

3. STATUTORY REQUIREMENTS AND GUIDELINES

3.1. LEGISLATION

3.1.1. Environmental Planning & Assessment Act 1979

The proposed modification to DA/2007/083 is being assessed under the provisions of the *Environmental Planning and Assessment Regulation Act 1979*. The EP&A Act provides the framework for the assessment and approval of developments proposed within NSW.

3.1.2. Environmental Planning & Assessment Regulation 2000

Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) sets out the relevant thresholds for designated development. Part 1, section 32 of Schedule 3 makes the following provision in relation to waste management facilities or works:

(1) Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recycle, recover, use or reuse material from waste and:

- *a. That dispose (by landfilling, incinerating, storing, placing or other means) of solid or liquid waste:*
  - *i. That include any substance classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or*
  - *ii. That comprises more than 100,000 tonnes of 'clean fill' (such as soil, sand, gravel, bricks or other excavated or hard material) in a manner than, in the opinion of the consent authority, is likely to cause significant impacts on drainage or flooding, or*
  - *iii. That comprises more than 1000 tonnes per year of sludge or effluent, or*
  - *iv. That comprises more than 200 tonnes per year of other waste material, or*
- *b. That sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse, and*
  - *i. That handle substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or*
  - *ii. That have an intended handling capacity of more than 10 000 tonnes per year of waste containing food or livestock, agricultural or food processing industries waste or similar substances, or*
  - *iii. That have an intended handling capacity of more than 30 000 tonnes per year of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material, or*
- *c. That purify, recover, reprocess or process more than 5000 tonnes per year of solid or liquid organic materials, or*
- *d. That are located:*
  - *i. In or within 100 metres of a natural water body, wetland, coastal dune field or environmentally sensitive area, or*
  - *ii. In an area of high water table, highly permeable soils, acid sulphate, sodic or saline soils, or*
  - *iii. Within a drinking water catchment, or*
  - *iv. Within a catchment of an estuary where the entrance to the sea is intermittently open, or*
  - *v. On a floodplain, or*
  - *vi. within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to*

topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

(2) This clause does not apply to:

a. Development comprising or involving any use of sludge or effluent if:

i. The dominant purpose is not waste disposal, and

ii. the development is carried out in a location other than one listed in subclause (1) (d), above, or

b. development comprising or involving waste management facilities or works specifically referred to elsewhere in this Schedule, or

c. development for which State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas requires consent.

The existing and proposed operation of Yeronga Landfill continues to fall within the definition of a General Solid Waste Landfill (non-putrescible waste) and Special Waste Landfill (waste tyres).

3.1.3. Protection of the Environment Operations Act 1997

EPL No. 13222 was granted by the EPA in 2007 under the *Protection of the Environment Operations Act* 1997.

All landfills must meet the requirements of the POEO Act and regulations. The licensee must not pollute waters in breach of section 120, cause air pollution in breach of sections 124, 125 or 126, or emit offensive odour in breach of section 129 of the POEO Act. The licensee must notify the EPA of pollution incidents causing or threatening material harm to the environment within the meaning of section 148 of the POEO Act.

3.1.4. Protection of the Environment Operations (Waste) Regulation 2014

The *Protection of the Environment Operations (Waste) Regulation 2014* relates to waste management and includes provisions for recordkeeping, measurement, monitoring, tracking, and reporting for waste facilities. Measures for recordkeeping and waste management in accordance with the POEO Act are described in section 5.1.2 and section 8.

3.1.5. Contaminated Land Management Act 1997

The Contaminated Land Management Act 1997 (CLM Act) was amended in 2008 (see Contaminated Land Management Amendment Act 2008 (CLM Amendment Act)).

The CLM Amendment Act introduced additional powers of the EPA including (but not limited to):

- Introduced power for the EPA to require investigations of site contamination.
- Amalgamated the investigation and remediation stages into a single 'management' stage that can cover investigation, remediation or both.
- Enabled the EPA to issue a management order or to withdraw its approval of a voluntary management proposal that has not delivered a satisfactory outcome in managing contamination.
- Required landowners and those carrying out certain activities to notify the EPA of contamination when it becomes aware, or ought reasonably to have become aware, of that contamination.
- Clarified that the EPA and local authorities can disclose site audit statements and reports that relate to statutory site audits.

3.1.6. Biosecurity Act 2015

The *Biosecurity Act 2015* provides a legal framework for the management of weeds pests and diseases in NSW. In general:

- All land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about.
- Local government area (LGA) specific strategic weed management provides guidance on the outcomes expected to control weeds on private and public property.

'Priority weeds,' weeds that need to be controlled under the Biosecurity Act and controlled duties of the South East, including the Upper Lachlan Shire are listed on the NSW WeedWise website: https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=128.

3.2. GUIDELINES

3.2.1. EPA Landfill Guideline

The EPA Landfill Guideline provides a framework for the environmental management of landfills in NSW by specifying a series of minimum standards for design and construction techniques, site operations, monitoring and reporting protocols, and post-closure management. The standards relevant to the proposal have been incorporated into the waste management measures listed in section 0, including:

- Leachate control.
- Spill and pollution management.
- Stormwater management.
- Landfill gas.
- Amenity issues (odour, dust, litter and debris control).
- Covering waste.
- Final capping and revegetation.
- Closure.

The minimum standards in the EPA Landfill Guidelines reflect the following broad goals for landfilling in NSW:

- landfills should be sited, designed, constructed and operated to cause minimum impacts to the environment, human health and amenity.
- the waste mass should be stabilised, the site progressively rehabilitated, and the land returned to productive use as soon as practicable.
- wherever feasible, resources should be extracted from the waste and beneficially reused.
- adequate data and other information should be available about any impacts from the site, and remedial strategies should be put in place when necessary.
- all stakeholders should have confidence that appropriately qualified and experienced personnel are involved in the planning, design and construction of landfills to high standards.

3.2.2. Waste Classification Guidelines

The Classifying Waste Guidelines provides a framework for classifying waste types, which are defined in clause 49 of the POEO Act.

The Classifying Waste Guidelines was applied to the current proposal, with the waste types identified in Section 4 as special waste (waste tyres) and general solid waste non-putrescible (building and demolition waste) using this classification system.

3.2.3. Managing Stormwater Guideline

The Managing Stormwater Guideline is used in applying the principles and practices of erosion and sediment control to landfill operations. An erosion and sediment control plan (ESCP), based on the Managing Stormwater Guidelines has been built into Section 6.9.

3.2.4. WARR Strategy

The WARR Strategy provides directions for a range of priority areas relating to waste in accordance with the NSW Government's waste reforms in NSW 2021: a plan to make NSW number one, which include:

- Avoiding and reducing waste generation.
- Increasing recycling rates.
- Increasing waste diverted from landfill.
- Managing problem wastes better.
- Reducing litter.
- Reducing illegal dumping.

Waste materials easily reused or recycled are not include within the permitted waste types received at Yeronga Landfill. The litter reduction priority is relevant to the current proposal, with management of litter and debris at the landfill. Litter is primarily prevented by not receiving whole loads of paper and plastic). General construction waste and shredded tyre loads may contain small amounts of light material that could be dispersed by wind. Wild blown litter is minimised by moving loads into the cell void as soon as they have been inspected for any contaminants. In addition, litter is further controlled with daily cover placed on top of the newly arrived waste.

4. ACCEPTED WASTE STREAMS

Under the proposed modification, Yeronga Landfill will dispose of waste tyres and a wider range of building and demolition waste.

The following classes of waste are defined in clause 49 of Schedule 1 of the POEO Act:

- special waste (tyres).
- general solid waste (non-putrescible).

Under the POEO Act (Schedule 1), building and demolition waste means unsegregated material (other than material containing asbestos waste or liquid waste) that results from:

> *(a) the demolition, erection, construction, refurbishment or alteration of buildings other than:*
> *(i) chemical works, or*
> *(ii) mineral processing works, or*
> *(iii) container reconditioning works, or*
> *(iv) waste treatment facilities, or*
> *(b) the construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports, and includes materials such as:*
> *(c) bricks, concrete, paper, plastics, glass and metal, and*
> *(d) timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP), but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed).*

Table 4-1 Proposed waste types and volume

Waste type	*Source*	*Quantity*	*NSW waste classification*
Building and demolition	Construction companies ACT	Up to a total of 10,000 tonnes per annum, subject to the amount of tires received and the DA lodge with Bland Shire.	General solid waste (non-putrescible)
Tyres	Various retailers in NSW and ACT	Up to 5000 tonnes per annum	Special waste
Total volume of waste	Businesses in NSW and ACT	Up to a total of 10,000 tonnes per annum*	General solid waste (non-putrescible) and Special waste

*A development application is with Bland Shire to increase the total amount received to 18,000t/annum.

Building and demolition waste will include mixed loads from authorised suppliers of non-putrescible waste. These loads will comprise a combination of virgin-excavated natural material, building and demolition waste as defined within the definition of general solid waste (non-putrescible).

The operator will ensure that there are no single loads of plastics, glass, paper and paper products, and metal, or any loads containing treated timbers and products containing asbestos, in accordance with best practice guidelines endorsed by NSW EPA. Any hazardous wastes would be removed to appropriate licenced facilities.

Some level of plastic, glass, metal, paper and paper containing products may be present in mixed demolition loads. Allowance for this has been made in the application for modification to DA/2007/083.

Waste tyres means used, rejected or unwanted tyres, including casings, seconds, shredded tyres or tyre pieces. No other special wastes will be disposed of at Yeronga Landfill.

5. YERONGA LANDFILL OPERATIONS

5.1. WASTE DELIVERIES AND SORTING

Yeronga Landfill receives waste under contract from licenced sources in the ACT, including ACT Recyclers and Canberra Concrete Recyclers. Other new sources would be introduced over the operational life of Yeronga Landfill.

Under current management and legal arrangements, the sources of waste disposed at Yeronga Landfill are restricted to premises that have sorted (segregated) building and demolition waste, and exclude the following:

- Waste liable to a Metropolitan Levy by a Governmental agency, and/or any Metropolitan Levy Area waste as defined by law and/or any waste that is from a Metropolitan Levy Area.
- Asbestos.
- Any product containing bitumen.
- Any products containing petroleum.
- Treated timber.
- Any landfill gas or anything derived from landfill gas.
- Any landfill leachate or other waste derived from landfill leachate.
- Any other good, material, substance, chemical or similar that is prohibited by law to be used as landfill.
- Any other good, material, substance, chemical or similar that is prohibited by law to enter and/or be situated within the premises of a licensed waste disposal facility.

Loads are screened, segregated, checked, authorised and also subject to a legally binding assurance contract prior to acceptance for transport to the landfill site.

Waste tyres would come from various tyre retailers in NSW and ACT.

5.1.1. Waste screening and sorting

Sorting at the source

To ensure that unapproved waste types (including plastics, glass, paper, paper products, metals, treated timber and products containing asbestos) are not disposed of at this site, the following process is currently used at the waste source:

1. All loads are inspected on delivery to the ACT waste facility.
2. Some contamination is removed from waste loads by hand for minor contamination (e.g. spent corking cartridges).
3. An excavator with a sieve bucket is used to separate larger waste items such as steel and copper.
4. An excavator grab used to remove large metal contaminants.
5. Contaminants unsuitable for recycling are disposed of at another licensed landfill. Recyclables sent to approved ACT facility.
6. Steel, metal and recyclable waste sent for recycling.

Sorting on site

Once on site, the following process is used to inspect and manage waste for landfill:

1. All vehicles delivering waste to the facility place the content of the load on level ground adjacent to the tip face.
2. The waste is spread to allow inspection and retrieval of any contaminants.
3. Contaminants are held in appropriately signed and covered storage containers on site.

4. A spreadsheet is used for continuous recording and monitoring of waste details and volumes.
5. Contaminants are removed from site and either recycled or disposed of at an appropriately licensed facility.
6. Where ongoing issues of contamination are identified, the waste source is contacted and a complaint lodged.

5.1.2. Record keeping

All vehicles that enter Yeronga Landfill, including those delivering waste, have the following information recorded:

a) The date and time the vehicle enters and leaves the facility.
b) The registration number of the vehicle.
c) The purpose of entry.
d) The weight of the vehicle.

The following information is recorded for each delivery of waste received at the facility:

a) The amount of any waste delivered, its waste type, and its waste stream.
b) The amount of any other material delivery and a description of the nature of that other material.
c) The date and time the delivery is made.
d) The registration number of the vehicle used to make the delivery.
e) The name and address of the facility from which the waste was transported, and the code or number of any environment protection licences for that facility.
f) In the case of an occupier who is required to pay contributions under section 88 of the POEO Act, particulars of where any waste or other material delivered is placed at the facility.

5.1.3. Waste handling and disposal

The waste handling and disposal process followed at Yeronga Landfill are described (**Table 5-1**).

Table 5-1 Waste handling and disposal process summary

Process components and activity description
Source – waste collection centre
• Waste is segregated and screened by private contractors prior to delivery. • Agreement in place to ensure content of waste received in accordance with DA consent. • Onsite workplace safety measures to ensure safe handling of waste and operation.
Vehicle – loading of trucks and preparation for transport
• Loads checked/screed by operator and driver to ensure content of load is in accordance with agreement and DA conditions. • Vehicle placed over weighbridge (private and public weighbridges available at Young and Belconnen). • Loads covered for transport to landfill site. • Logbooks completed. • Waste tracking commenced.
Transportation – road transport to landfill site

- Transportation via public road system on approved haulage routes appropriate for type and weight of load.

Landfill – onsite disposal within landfill site

- Onsite disposal in accordance with original DA consent conditions and description of activity/operation as submitted and approved by Council and licenced by EPA.
- Access via approved roadway.
- Water truck available onsite at all times to manage dust generation.
- Up to 5 operators may be onsite to manage receival activities including documentation for reporting.
- Machinery onsite include dozer, dump truck, excavator, frontend loader and other equipment to ensure safe, efficient and responsible operation and management of the facility.

Landfill management

- Operational activities and management systems in accordance with appropriate best practice
- Site preparation including preparation of base clay liner in accordance with EPA guidelines.
- Cells progressively filled and daily/intermediate cover applied.
- Equipment and machinery routinely checked, serviced and maintained in accordance with licencing and manufacturers recommendations and schedules.
- Rehabilitation schedule implemented, in accordance with future land use, previously approved DA, and climatic conditions.
- Logbooks, data sheets, EPL annual returns licence records are documented, completed and submitted to responsible authorities.
- Records and filing systems maintained in accordance with recommended best practice.
- Transport vehicles prepared for return transit to source, checked and washed.
- Overnight storage of transport vehicles may occur either onsite, in transit (truck parking areas) or appropriate locality in close proximity to driver's residence.

Transit – return to source with empty vehicle

- **Exiting vehicle details are recorded.**
- Transport vehicles return to source via approved public road system.

5.1.4. Staffing and operating hours

The Licensee is responsible for day to day operations. This includes organising and supervising the load receivals, landfilling equipment and directing all landfilling operations. Up to 6 staff members are employed at Yeronga Landfill in a range of capacities. Current operational arrangements do not require a full-time site staff. Site management is by dedicated personnel. Those managing the site also operate machinery whilst onsite. Their management of the site is in accordance with current workplace and safety procedures and guidelines.

Operating hours are 8:00am to 7:00pm, 7 days per week.

5.1.5. Machinery stored and maintained

Machinery maintained at Yeronga Landfill and used in daily operations includes:

- 1 Frontend Loader.

- 1 Water Truck.
- 1 Dump (Tipping) Truck.
- 1 Bulldozer.

This machinery is regularly maintained. Heavy vehicles used to transport waste to Yeronga Landfill are generally not stored onsite and are either parked at a separate depot or maintained/parked at the responsibility of the respective driver.

5.1.6. Security and access

Yeronga Landfill is accessed from a single access point on Euroka Road. Access to the site is by appointment only. There is no weighbridge at the facility and vehicles loads are weighted prior to coming onsite. All vehicle movement are recorded with records kept at the site office.

6. ENVIRONMENTAL MANAGEMENT

6.1. LITTER AND DEBRIS

Litter and debris control measures will be consistent with those implemented in the existing landfill facility. To prevent litter spreading from the waste cell into surrounding areas, the following management measures will be implemented:

- Waste loads are screened to minimise windblown materials.
- No whole loads of paper and plastic are received at the site.
- Daily or immediate cover of waste and regular compaction.
- Litter fences installed, inspected regularly and any trapped litter removed.
- Stormwater is directed around the active filling areas with soil berms.
- Drainage lines have trash filters to prevent litter being washed or pumped into watercourses.
- Vehicles will be kept clean to reduce mud and litter impacts on the local amenity.
- Equipment available to remove mud and litter from vehicles before they leave the site. This may include aggregate at egress points, hand-held pressure-washer, and vibration grids.
- Signage at the entrance to Yeronga Landfill notifying drivers to clean to the underside of the vehicle or the wheels prior to accessing public roads.

6.2. DUST

Dust generation will be controlled during operation with the following management measures:

- Minimising areas of exposed soil.
- Stabilisation of exposed areas and stockpiles as soon as practicable.
- Revegetation of completed areas as soon as practicable.
- Minimising drop heights when unloading waste, where practicable.
- Watering of exposed surfaces, including stockpiles, during periods of dry weather and high winds.
- Watering of entrance road.
- Continual availability of water truck on site to mitigate any potential dust issues form vehicle movement.
- Enforcing speed limits on site.
- Covering of loads.
- Visual inspection and cleaning of trucks, including use of wheel-wash and shaker grids, where necessary.
- Where practical and necessary, installation of wind barriers to deflect wind from erodible areas and minimise exposure of falling dusty materials to wind.
- During windy conditions, when waste arrives it must be inspected and covered with soil immediately to reduce the possibility of litter leaving the site.
- When conditions are more favourable, remove cover material and compact waste as usual, then cover with the necessary cover material.
- Works causing dust emissions, must cease during windy conditions and if necessary, the water truck will be used to reduce the risk of dust leaving the facility.

6.3. NOISE

There are no known unacceptable noise or vibration impacts on any sensitive receivers from Yeronga Landfill. Heavy vehicle movement and operation of onsite machinery are the primary sources of noise generated. The machinery used are maintained to ensure no excessive noise levels from the operation of the facility. No blasting activities are approved or planned at Yeronga Landfill.

Noise from Yeronga Landfill must not exceed:

a) 35 dB(A) LAeq(15 minute) during the day (7am to 6pm) Monday to Friday and (7am to 1pm) Saturday.
b) 30 dB(A) LAeq(15 minute) during the evening (6pm to 10pm) Monday to Friday.
c) at all other times 30 dB(A) LAeq (15 minute), except as expressly provided by this licence.

Where LAeq means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

6.4. ODOUR

There are no known odour issues with the existing site. Yeronga Landfill only accepts non-putrescible waste and therefore produces minimal odour.

Odour will be further controlled with the following management measures:

- Daily covering/intermediate cover of waste.
- Active tipping face kept to a practical minimum.
- Best management practices for screening of waste, detection of landfill gas and monitoring/managing leachate.
- Other management and health/safety considerations in accordance with current landfill operational guidelines.

An odour complaint management system is in place with the existing landfill facility and will continue with the current proposal.

6.5. FIRE PREVENTION AND CONTROL

6.5.1. Fire prevention

No incineration of waste or burning of any waste is permitted at Yeronga Landfill. The following fire-prevention measures, in compliance with the Solid Waste Landfill Guidelines, will be implemented:

- Signs that clearly inform customers and staff that flammable liquids are restricted on the site.
- Emergency contacts list at the site entrance.
- All fuels or flammable solvents for operational use are stored in an appropriately ventilated and secure store located on unfilled land.
- All flammable liquids are stored within a bund that has a capacity of 110% of the volume of the flammable liquids.
- Flammable solid wastes must not be stockpiled at the premises.
- Firebreaks will be created and maintained around all filled areas, equipment and site buildings.
- Fire-fighting equipment will be installed at the site, including at flammable waste storage areas.
- All fire-fighting equipment will always be clearly signposted and accessible.
- All fire-fighting equipment will be maintained according to a regular schedule (at a minimum, weekly visual checks for damage and annual test operation of the equipment).
- Staff should be trained in all of the above fire-prevention and fire-fighting techniques.
- At least one employee will have Rural Fire Service experience and or training.

6.5.2. Waste tyres

Fire risk was assessed under the original DA/2007/083 and was deemed to be high due to the combustible nature of many construction and demolition waste materials. The following actions will be undertaken to manage the fire risk associated with waste tyres:

- Uncovered stockpiles of shredded tyres will not exceed 20 tonnes.
- Uncovered stockpiles of whole tyres will not exceed 50 tonnes.
- Shredded tyres will be in pieces smaller than 250 mm in any direction or have had its walls removed.
- Tyres will be landfilled in discrete blocks of 50 to 80 tonnes, segregated by 400mm of clean fill.
- Un-shredded tyres will not be stored for more than 4 weeks or landfilled at Yeronga Landfill.

6.5.3. Fire response

In the event of a fire occurring at Yeronga Landfill, the Licensee shall take prompt action to extinguish the fire. The local Fire Brigade will be immediately notified of all fires irrespective of the extent of the fire and whether or not it has been controlled.

The following details must be recorded for all fires and for each day that the fire is burning:

- The time and date when the fire started.
- Whether the fire was authorised and if not, the circumstances which ignited the fire.
- The time and date the fire burnt out or was extinguished.
- The location of the fire (e.g. clean timber stockpile, putrescibles cell, etc.).
- Observations made in regard to smoke direction and dispersal.
- The amount of waste combusted by the fire.
- Action taken to extinguish the fire.
- Action taken to prevent a reoccurrence.

In the event of a surface fire occurring at the site, water and/or earth shall be used to extinguish the fire. Underground fires shall be treated on a case by case basis, but it will normally be necessary to excavate and spread the smouldering material and then smother it with earth or water.

A water tanker capable of being used for firefighting will be sourced to assist with extinguishing the fire.

6.6. WEEDS AND PEST ANIMALS

Vermin have not been a problem at Yeronga and no complaints about such have been received. As such, no active measures are employed to control vermin. Ponding of water at landfills may serve as a breeding ground for certain insects such as mosquitos.

Yeronga Landfill will be inspected for priority weeds twice a year. Weeds requiring control within the Bland Shire local government area (LGA), list available from NSW WeedWise: https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=22, will be sprayed in spring and autumn.

6.7. LEACHATE CONTROL

The EPA Landfill Guidelines outline a range of leachate disposal options including discharge to sewer, tanking off-site to a licensed treatment facility, evaporation, irrigation or injection back into the landfill.

Leachate management at Yeronga Landfill is achieved with the installation of a compacted clay liner on the base and walls of all waste cells, 900 mm thick with a permeability of less than 1 x 10^{-9} mm/second. Clay for the lining is sourced onsite and stockpiled during construction of the sand pits that will form the waste cells.

Leachate generation is minimised by daily cover of waste, stormwater diversion, and revegetation of cells.

Groundwater levels will be monitored by placing piezometers (x 4) adjacent to the cell.

Yeronga Landfill does not have a licensed discharge point.

6.8. SPILL AND POLLUTION MANAGEMENT

6.8.1. Prevention

Previous groundwater monitoring results indicate that Yeronga Landfill is having a negligible impact on the environment and is performing within accepted environmental thresholds, with no remediation measures required as of September 2019.

A Groundwater Management Plan accompanies the SEE report prepared by Salvestro Planning to support the proposed modification.

The risk of spills and pollution of waterways and soil will be managed by:

- All chemicals, fuels, oils, batteries and other materials with the potential to pollute held in a bunded container. The container will be covered and signposted.
- Any soils impacted by hydrocarbons will be excavated to a depth of 300 mm and stockpiled on an impervious surface. Fertiliser, water and organic matter combined with the impacted soils to promote microbial activity over summer, with soil and additives mixed and turned on a monthly basis. After treatment, soil spread as cover over filled areas and revegetated, and photographic documentation of the treatment recorded.

6.8.2. Remediating water pollution

Remediation of water pollution is not considered to be required at this point in time. If pollution of the groundwater and /or surface waters are detected by the leachate and water quality monitoring program, action will be taken to remediate the affected waters in consultation with the EPA. Groundwater monitoring data from 2010 and 2014 is provided within the Groundwater Management Plan in Appendix C.

6.9. LANDFILL GAS

There are no known landfill gas issues with the site that require control. Landfill gas production will be limited by minimising organic material inputs in landfill. As the waste will be predominantly non-putrescible, landfill gas infrastructure will not be required.

6.10. STORMWATER MANAGEMENT

The ESCP provided below was prepared in consideration of the Managing Stormwater Guideline and details the erosion and sediment controls for the Yeronga Landfill.

6.10.1. Erosion and Sediment Control Plan

This ESCP addresses the following issues:

- measures to control erosion and sediment during the life of the project.
- sources of and pathways for 'clean' and 'dirty' water.
- location and size of water-quality controls.
- operation and maintenance requirements.
- monitoring and reporting requirements (see section 8).

Yeronga Landfill was previously limited to receiving inert construction and demolition waste with limited potential to pollute soil and groundwater including:

- Virgin excavated natural material (clay, gravel, sand, soil and rock).
- Building and demolition waste (bricks, concrete and (untreated) timber); and
- Used, rejected and unwanted tyres (including shredded tyres and tyre pieces).

Expanding the variety of construction and demolition materials received at Yeronga Landfill requires e controls to minimise soil and water contamination from:

- Timber and wood products potentially lowering pH within the landfill mobilising aluminium and other metals.
- Paper and cardboard potentially lowering pH within the landfill mobilising aluminium and other metals.
- Gypsum (e.g. plasterboard): Bulk loads of gypsum products will not be disposed of at Yeronga Landfill. Small amounts will be accepted mixed with general construction and demolition waste (e.g. attached to bricks, timber). The alkaline nature of gypsum will offset low pH discussed above.
- Lead paint: lead-based paint containing > 0.06% total lead will not be disposed of at Yeronga Landfill, small amounts of paint are likely to be on painted bricks and timber.

Erosion and sediment control measures

The following regulatory requirements have been considered included in the site design and this ESCP:

- Yeronga Landfill will have a duration of disturbance greater than two years. Sediment basins will be designed to capture and treat runoff from the 90th percentile, five-day rainfall event.
- all water diversion structures will be designed for a 20-year ARI design storm.
- treated discharge waters will not contain more than 50 mg/L of total suspended solids.

The construction of the roads, facilities and structures were already completed before landfilling commenced. The operational strategy will be to provide erosion control measures where necessary, and to progressively and promptly provide permanent stabilisation of embankments and channels through revegetation.

The tree cells at Yeronga Landfill range in size from 3.0 to 4.8 ha. At any time, only one cell will be actively filled, with one or two in the process of final capping and rehabilitation. Thus, the total area requiring erosion and sediment control will be about be between 6.3 ha and 11.1 ha. All runoff within these areas that has not been in contact with waste will be directed to constructed sediment basins. Ongoing erosion control will be provided through progressively topsoiling and revegetating the completed sections of each landfill cell as soon as practicable after completion of earthworks

Sources and pathways for clean and dirty water

The following key principles have been adopted in the design of Yeronga Landfill and the preparation of this ESCP:

- Minimise the area of soil disturbed and exposed to erosion at any point in time.
- Minimise the volume of runoff to be managed by minimising the contributing catchment area active and bare of vegetation at any particular time.
- Conserve topsoil for reuse on the site during rehabilitation/regeneration.
- Progressively and promptly rehabilitate disturbed areas, through:
    - a stable landform topography with minimal slope lengths.
    - stable drainage lines.
    - establishing 70% groundcover as soon as practicable.
- Divert 'clean' runoff from adjoining areas surrounding the landfill and other disturbed areas.
- Keep sources of different quality water separate from each other, including:

  - leachate drainage from the base of the landfill and the immediate area of the active waste placement.
  - 'dirty' runoff containing sediment from soil stockpiles and rehabilitated landfill.
  - 'clean' runoff from undisturbed areas with no waste-related activities and areas that are fully rehabilitated (with ground cover of at least 70%).
- Reuse or dispose of water on site to ensure:
  - zero discharge of leachate by means of evaporation ponds and/or controlled irrigation onto the landfill.
  - reuse of 'dirty' runoff for dust suppression.
- Install and maintain appropriate erosion and sediment controls to ensure that any discharge from the landfill meets the relevant water-quality limits:
  - pH – 6.5 to 7.5.
  - total suspended solids (TSS) – 50 mg/L.
  - turbidity – 100 NTU.
- Monitor water quality in receiving waters and within water bodies on site to ensure that the relevant water-quality limits are being met.

Water quality controls

SURFACE WATER

Each area will have separate water management systems designed to cater for its runoff and water-quality characteristics. Key elements of the surface water pollution control strategy are:

- All leachate will be directed into leachate ponds for evaporation, re-injection or controlled irrigation onto the landfill area. The leachate collection and disposal system will be a 'closed' system isolated from surface runoff. This will be achieved by bunding the active landfill area to exclude up-slope runoff and construction of the leachate evaporation ponds with an above-ground berm.
- Runoff from areas likely to generate sediment will be directed into designated sediment basins which will be sized to meet the sediment basin design. These basins will also provide storage capacity for on-site water supply purposes (dust suppression and compaction of capping layers).
- Runoff from office and access roads will be directed to a small collection pond for trapping oil, sediment and litter. After removal of any oil, litter and sediment, water will be allowed to drain overland to sediment basins.
- Runoff from areas unaffected by landfill activities will be allowed to discharge from the site.

SEDIMENT CONTROLS

Land disturbance

All proposed erosion and sediment control measures will be implemented before clearing and stripping operations, including the installation of sediment fencing down-slope of any areas that do not drain toward the 'dirty' water treatment areas. Sediment fencing will be installed in accordance with Figure 6-1).

Access roads

Roads will be constructed to ensure surface drainage is optimised and stabilised, thereby reducing roadside erosion and sedimentation. Cross-fall drainage structures and mitre drainage will be implemented for the entire length of the roads. Crowning will generally be implemented on any steeper sections of the roads. Road runoff will be intercepted at regular intervals to reduce runoff velocity in each mitre drain.

Soil management

Stripping of topsoil will be undertaken when the soil is slightly moist thus reducing damage to soil structure. The topsoil will not be stripped in wet conditions to protect its structure.

During operations, emphasis will be on maximising the direct transfer of materials and minimising the need for stockpiling of subsoil and clay. However, there will still be a need for an active stockpiling area for storage of topsoil and excess soil and clay. Stockpiles will be placed in the designated area shown on Figure 6-1 to avoid impediment of the natural drainage line and minimise the likelihood of water ponding against the stockpile.

Water diversion and convergence

Runoff from disturbed areas of the site will be directed into a number of sediment basins that will be constructed progressively as the landfill cells are constructed. Four types of stormwater diversion and conveyance structures will be required:

- Cross-slope diversion banks with grades of about one per cent. These banks will be generally constructed in accordance with the typical design for earth bank (low flow) or earth bank (high flow).
- Down-slope channels located between cells 1 and 2, and cells 3 (as shown on Figure 6-1).
- Berm drains that run at grades around one per cent across the steep batters of the landfill. These drains divide the steep batter slopes into three approximately equal-length segments.
- Chutes constructed from half circle corrugated steel that convey runoff from berm drains on the landfill batters.

All water diversion and conveyance structures will be constructed to convey the 20-year ARI storm.

Figure 6-1 Erosion and sediment controls

7. CELL MANAGEMENT AND DESIGN

7.1. NEW CELL DESIGN

Applications to the EPA for a licence to construct and operate new cells at existing sites, must include specific details of the landfill design and operation:

- details of the engineered features including: a leachate barrier, leachate management system, stormwater management works, water quality monitoring installations, and monitoring infrastructure, and final capping.
- scaled plan diagrams of the facility, depicting the boundary of the premises, footprint of landfill cells, the locations of residences and other sensitive receptors, and the locations of other relevant infrastructure bores and farm dams.
- projections of the types and quantities of wastes to be received, the classification of the wastes, the design capacity of the landfill or cell, and the expected life of the landfill or cell.
- a filling plan that is consistent with any planning approval, showing the proposed layout of the cells, the type and amount of waste to be deposited in each cell, the projected rate of filling, and the location of any special burials (e.g. asbestos waste or clinical waste).
- details of any waste reprocessing to take place at the landfill, the nature of any resources to be recovered from wastes received at the landfill, and the locations and sizes of any proposed stockpiles.
- Environmental risk assessment, mitigation measures, monitoring programs for surface water and groundwater contamination, landfill gas migration, air quality, odour, water balance calculations for leachate management.
- confirmation that the application has been prepared by a suitably qualified and experienced person(s).

7.2. COVERING WASTE

Daily cover will be applied to the active waste cell each day before close of business.

There is no condition regarding cover in EPL No. 13222, but generally, the cover material will comprise soil (virgin excavated natural material) from the site, with a minimum cover depth of approximately 100 mm. Alternative cover material may be used in loads with a high proportion of soils and/or bricks, as these materials may be sufficient for daily cover.

Landfilled waste must be covered regularly during operations with clean soil to minimise odour, dust, litter, risk of fire and rainfall infiltration into the waste. Vermin and odour are not deemed to be of concern at Yeronga Landfill.

7.3. EFFICIENT USE OF LANDFILL SPACE

The EPA Landfill Guidelines do not provide a compaction density target for landfills, though moderate compaction is desirable to reduce the lowering of waste levels in a landfill as a result of consolidation processes over time. Compaction is less advantageous in landfills containing almost entirely non-putrescible waste.

The current filling plan involves the gradual filling of waste in discrete cell units. As far as is practical, filling of each waste disposal cell will continue until the final landform is reached. Filling will then commence in the next numbered waste disposal cell. No more than two waste disposal cells shall, at any one time, be filled concurrently.

7.4. CAPPING AND REVEGETATION

7.4.1. Progressive capping and rehabilitation

All completed cells must be capped and revegetated as soon as practicable after the final delivery of waste to the cell. The final capping must:

- reduce rainwater infiltration into the waste and thus minimise the generation of leachate (infiltration from the base of the final cap will be less than 5% of the annual rainfall).
- stabilise the surface of the completed part of the landfill.
- reduce suspended sediment and contaminated runoff.
- minimise dust, litter and the risk of fire.
- prepare the site for its future use; this includes protecting people, fauna and flora on or near the site from exposure to pollutants still contained in, or escaping from, the landfill.

The EPA Landfill Guidelines provide acceptable design criteria and monitoring programs for final capping.

7.4.2. Final capping and revegetation

A rehabilitation plan was approved under the original DA/2007/083 (Appendix D). The licensee will ensure that this plan and revegetation proposals will be progressively established, in accordance with EPA Guidelines (Managing Urban Stormwater - Mine and quarry rehabilitation).

Final capping of the waste cells involves installing a compacted clay capping layer, 500 mm thick. This will be covered with a topsoil layer 300 mm thick, domed to a minimum slope of 5% and a maximum slope of 33%.

The waste cell will then be revegetated with mix of annual and perennial pastures species for livestock grazing.

Revegetation of the perimeter of the site outside of the landfill will include woody vegetation with a mixture of endemic trees and shrubs. Trees and shrubs will not be planted on the cells to avoid damaging the capping material and causing ingress of stormwater.

7.5. CLOSURE

EPL No. 13222 requires the licensee to submit a closure plan to the EPA within three months of the last load of waste landfilled at Yeronga Landfill in accordance with section 76 of the POEO Act. In accordance with section 76, the closure plan must:

a) specify the steps taken (or to be taken) in closing, stabilising or rehabilitating the premises and the time-frame for doing so, and
b) (b) provide for a post-closure monitoring and maintenance program, and
c) (c) identify any proposed future uses of the premises, and
d) (d) comply with any other specified requirements relating to the plan.

8. RECORDING, MONITORING AND COMPLIANCE

8.1. ADEQUATE STAFF AND TRAINING

The licensee will ensure that Yeronga Landfill is adequately staffed by qualified and experienced personnel. At a minimum, staff training shall be undertaken to ensure that:

1. all operators of compaction or earthworks equipment are skilled at undertaking all tasks required of them.
2. all those that operate gas testing, water sampling, or water testing apparatus are familiar with required testing and sample retention protocols to a standard approved by the EPA.
3. all those that are to inspect incoming wastes are skilled at identifying wastes that are unacceptable and can accurately record data.

To assist with the collection of opportunistic surface water samples, a collection of appropriate sample bottles will be retained and readily accessible on site. Staff members will be trained in the collection, handling and dispatch of water samples for analysis.

8.2. RECORDKEEPING

The private operators of the Yeronga Landfill keep a copy of EPL No. 13222 at their residence at Cartwrights Hills as there is no regular staff member or office onsite. Records detailed in sections 8.2.1 to 8.2.2 are also kept at the residence for time periods stipulated in EPL No. 13222.

8.2.1. Waste type and volume

Yeronga Landfill is not regularly staffed and does not have a site office, however, the delivery of waste material including details of types and volumes are pre-arranged with regular commercial customers. The following records are kept within a waste register for at least four years:

- The date(s) of the delivery.
- Type(s) and volume(s) of waste.
- The name and business of the delivery driver.

All records required to be kept under the licence must be:

- In a legible form, or in a form that can be readily transferred to a legible form.
- Kept for a least four years after the monitoring or vent to which they relate took place.
- Produced in a legible form to any authorised office of the EPA who asks to see them.

An example waste register is provided in Appendix B.

8.2.2. Pollution complaints records

The owner/operators of Yeronga Landfill will maintain a legible record of all complaints made in relation to pollution arising from any activity carried out under Licence No. 13222.

Pollution complaints records will include the following details:

- Date and time of the complaint.
- Method by which the complaint was made.
- Personal contact details of the complainant, provided by the complainant, if none were provided, a note to this effect.
- The nature of the complaint.

- The action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant.
- if no action was taken was taken by the licensee, the reason why no action was taken.

The record of a complaint must be retained for at least four years after the complaint was made. These records must be provided to any officer of the EPA who asks to see them.

Telephone complaints line

The licensee will operate a telephone complaints line, visible through signage at Yeronga Landfill for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle, or mobile plant associated with activities regulated by the licence.

8.2.3. Water quality monitoring records

The following records are kept in respect of any water or soil samples required to be collected for the purposes of EPL No. 13222:

- The date(s) that the sample was taken.
- The time(s) at which the sample was collected.
- The point at which the sample was taken.
- The name of the person who collected the sample.

8.3. ENVIRONMENTAL MONITORING

8.3.1. Operations monitoring

Monitoring over the lifespan of the landfill will include, but not be limited to:

- Monitoring groundwater quality and levels if ground water impacts are suspected.
- Inspecting ERSED controls and drains following rainfall.
- Volume of landfill space consumed.
- Monitoring dust leaving the site during windy weather.
- Monitoring presence of litter on site, including on litter fences.
- Monitoring integrity of the final cap, recording signs of degradation including cracks, vegetation stress or slumping.

Water quality monitoring is not specified in the EPL No. 13222. If water quality impacts are suspected monitoring will occur at least once with samples taken from nominated sites during wet weather (more than 10 mm rainfall during the previous day).

During the operation of the site, annual reporting of surface water quality will be conducted. Changes in water-quality parameters from baseline values will be identified and further assessment will occur.

Monitoring of sediment basins will initially be at quarterly intervals to check that waste contaminants are not present in surface runoff. Any overflow of surface runoff from sediment basins will be monitored.

A Groundwater Management Plan for Yeronga Landfill is provided in Appendix C.

8.3.2. Post-closure monitoring

To assess the continued integrity and performance of the final capping, post-closure monitoring will include the following components:

- regular visual inspections for deterioration of the capping's condition, including erosion, cracking, dead or stressed vegetation, ponding, differential settlement, slope instability, and damage to any pipes, drains and other works installed on the final capping.
- regular surveys for indications of differential settlement, using appropriate techniques such as topographic surveys and settlement plates.
- repair and/or replacement of portions of the final capping found to be damaged.
- monitoring of leachate and rainfall volumes.

8.4. FINANCIAL PROVISION

Under Part 9.4 of the POEO Act, the EPA can require licensees to provide and maintain financial assurance to secure or guarantee funding for works. The current landfill EPL does not contain such a condition.

8.5. REPORTING

ELP No. 31222 requires an Annual Return be submitted to the EPA within 60 days of the end of each reporting period ending 22 December each year.

Each Annual Return should include:

1) a Statement of Compliance.
2) a Monitoring and Complaints Summary.
3) a Statement of Compliance - Licence Conditions.
4) a Statement of Compliance - Load based Fee.
5) a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan.
6) a Statement of Compliance - Requirement to Publish Pollution Monitoring Data.
7) a Statement of Compliance - Environmental Management Systems and Practices.

Within the Annual Return, the Statements of Compliance must be certified, and the Monitoring and Complaints Summary must be signed by:

a) the licence holder.
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

A summary all reporting requirements for Yeronga Landfill is provided in **Table 8-1**.

Table 8-1 Yeronga Landfill reporting requirements

Issue	*Reference*	*When to report*	*Agency to report to*
Pollution incidents	section 148 POEO Act	Immediately	EPA
Fire incidents		Immediately	
Pollution Incident Response Management Plan	POEO (General) Regulation 2009	Every 12 months	EPA
Closure works	Condition U1.1 of EPL No. 13222	31 December 2019	EPA
Annual Return	Condition R1.1 of EPL No. 13222	Every 12 months (after 22 December)	EPA via eConnect EPA or registered post.

8.6. WMP REVIEW

The POEO Act requires a review of Licence No. 13222 by the EPA every five years. The last review was completed in March 2018. This WMP will be reviewed every five years following the review of the licence and will be updated within six months of this review to incorporate any changes to the licence conditions.

9. CONCLUSION

NGH was engaged to prepare a Waste Management Plan (WMP) in relation to an existing waste disposal facility at 'Yeronga', Euroka Road, Quandialla. The subject land includes Lots 1 & 2, DP1039488.

This plan describes the principles, procedures and management of the waste that would be received at the facility, to manage waste impacts during operation. This WMP has been prepared to ensure that legal obligations are met and maintained in the management of all waste received at the site.

To support the modification of the current development approval, this WMP outlines measures to manage waste disposal during operation of the proposed facility. The WMP includes details on:

- The types and quantities of waste to be received at the facility.
- Measures to dispose and manage waste at the development.
- A program for recording and monitoring the effectiveness of these measures (Appendix B).

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APPENDIX A EPL NO. 13222

Environment Protection Licence

Licence - 13222

Licence Details	
Number:	13222
Anniversary Date:	22-December

Licensee

CRAIG WILLIAM BURNS

42 OLD BOMEN ROAD

CARTWRIGHTS HILL NSW 2650

Premises

'YERONGA'

EUROKA ROAD

QUANDIALLA NSW 2721

Scheduled Activity

Waste disposal (application to land)

Fee Based Activity	Scale
Waste disposal by application to land	Any capacity

Region

Riverina Far West

Suites 7-8, Level 1 Griffith City Plaza, 130-140 Banna Avenue
GRIFFITH NSW 2680

Phone: (02) 6969 0700

Fax: (02) 6969 0710

PO Box 397

GRIFFITH NSW 2680

Environment Protection Licence

Licence - 13222

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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

CRAIG WILLIAM BURNS
42 OLD BOMEN ROAD
CARTWRIGHTS HILL NSW 2650

subject to the conditions which follow.

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1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Waste disposal (application to land)	Waste disposal by application to land	Any capacity

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
'YERONGA'
EUROKA ROAD
QUANDIALLA
NSW 2721
LOT 1 DP 1039488, LOT 2 DP 1039488
EUROKA RD, 12.5KM SOUTH OF QUANDIALLA

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

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2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Waste

L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
T140	Tyres	As defined in Schedule 1, Division 2, Section 50 of the POEO Act.	Waste disposal (application to land)	The total quantity of tyres disposed of at the premises must not exceed 5 000 tonnes.
NA	Building and demolition waste	Limited to virgin excavated natural material (clay, grave, sand, soil and rock) and bricks, concrete and timber.	Waste disposal (application to land)	

L2.2 The total quantity of combined waste disposed of at the premises must not exceed 10 000 tonnes.

Note: As stated in your Development Consent DA/2007/083, no plastic, glass, metal, treated timbers, paper or paper products are permitted to be received or disposed of at the premises.

L3 Noise limits

L3.1 Noise from the premises must not exceed:
a) 35 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm) Monday to Friday and (7am to 1pm) Saturday; and
b) 30 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm) Monday to Friday; and
c) at all other times 30 dB(A) $L_{Aeq\ (15\ minute)}$, except as expressly provided by this licence.

Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L4 Hours of operation

L4.1 All work at the premises must be conducted between the following hours:
7am to 6pm Monday to Friday and 8am to 4pm Saturday and Sunday

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O4 Emergency response

O4.1 The licensee must extinguish fires at the premises as soon as possible.

O5 Processes and management

O5.1 The licensee must install and maintain lockable security gates at all access and departure locations.

O5.2 The licensee must ensure that all gates are locked whenever the landfill is unattended.

O6 Waste management

O6.1 Surface drainage must be diverted away from any area where waste is being or has been landfilled.

O6.2 There must be no incineration or burning of any waste at the premises.

O6.3 The licensee must submit to the EPA within three months prior to the last load of waste being landfilled a closure plan in accordance with Section 76 of the Protection of the Environment Operations Act 1997.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Environmental monitoring

M2.1 A record of each load that is disposed of at the premises must be recorded. The record must include the weight of the load and the type of waste contained in the load.

This record must be made available to the EPA on request.

M3 Recording of pollution complaints

M3.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M3.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M3.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M3.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M4 Telephone complaints line

M4.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M4.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M4.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be

completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Darren Wallett

Environment Protection Authority

(By Delegation)

Date of this edition: 22-December-2009

End Notes

2	Licence varied by notice	1520080 issued on 07-Mar-2014
3	Licence varied by notice	1553047 issued on 16-Jun-2017
4	Licence varied by notice	1563082 issued on 27-Mar-2018

APPENDIX B EXAMPLE WASTE REGISTER

Date / Time	*Waste classification**	*Waste description (e.g. concrete, steel, spoil)*	*Amount*	*Transporter*	*Receiving Facility*	*Waste Use (recycled/stored/ treated/disposed)*	*Reference (Docket / Transport Certificate/Invoice)*

* Waste Classifications:
1. Special waste (e.g. asbestos and tyres)
2. General solid waste (putrescible) (e.g. general litter and food waste)
3. General solid waste (non-putrescible) (e.g. glass, paper, building demolition waste, concrete)
4. Restricted solid waste
5. Liquid waste (e.g. oil, fuels, chemicals and pesticides)
6. Hazardous waste (e.g. lead-acid batteries and lead paint) 7. Spoil (clean fill) 8. Spoil VENM

APPENDIX C GROUNDWATER MANAGEMENT PLAN

GROUNDWATER MANAGEMENT PLAN

FOR

OPERATION OF WASTE DISPOSAL FACILITY AT "YERONGA", EUROKA ROAD QUANDIALLA, NSW

Submitted to: Mr Craig Burns
42 Old Bowman Road
CARTWRIGHTS HILL
NSW 2650

Ph: 02 6347 1393
Fx: 02 6931 8813

Submitted By: The Impax Group Pty Ltd
PO Box 6157
3 Crick Street
DUBBO NSW 2830

Ph: 02 6885 5536
Fx: 02 6885 3382

7 May 2009

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1 Introduction

The Impax Group was commissioned by Mr Craig Burns to prepare a Groundwater Management Plan (GMP) for a Waste Disposal Facility at "Yeronga", Quandialla (the site). The site is located approximately 12.5km south of Quandialla on Euroka Road, and is described as Lot 1 and Lot 2 in DP 1039488.

The site location is shown in *Figure 1* of *Annex A*.

1.1 Development Approval

The Waste Disposal Facility (Development Application Number DA/2007/083) was approved by Bland Shire Council on 23 June 2008, subject to several conditions of consent.

This GMP is required in order to satisfy Condition B2 of the conditions of development consent, which states the following:

> *Groundwater Management Plan*
>
> *The Groundwater Management Plan is to be provided to Council prior to the commencement of operations. The Groundwater Management Plan must provide details of predevelopment groundwater quality and measures to be implemented to monitor and maintain groundwater quality.*

1.2 Site Background

The site formerly operated as a sand quarry and a number of excavations remain at the site as a result of sand extraction activities. The approved waste disposal activities allow for the systematic filling of these excavation with inert waste.

The Impax Group prepared a Statement of Environmental Effects (SEE) as part of the planning process for the Waste Disposal Facility. The SEE provides detailed information on the proposed operation of the waste disposal facility.

1.3 Objectives of this Groundwater Management Plan

The primary objective of this plan is to satisfy Condition B2 of the conditions of development consent. More specifically, the objectives of this GMP are to:

- Identify and assess potential risks to groundwater quality posed by the operation of the waste disposal facility;
- Outline monitoring procedures that should be followed to assess baseline groundwater quality at the waste disposal facility; and
- Outline operational procedures and environmental controls that will be implemented to minimise or mitigate against potential risks to groundwater quality in the vicinity of the waste disposal facility.

2 Site Description

2.1 Site Location

The site is located in the Lachlan River Catchment, approximately 12.5km south of Quandialla and 55km east of West Wyalong.

The site location is shown in *Figure 1* of *Annex A*.

The property details are summarised in *Table 1*.

Table 1: Summary of Property Detail

	Description
Street Address	"Yeronga" Euroka Road, Quandialla NSW
Lot and DP Number	Lot 1 and 2 in DP 1039488
Geographical Coordinates (MGA94)	East 568250 North 6224975 (Site Entrance)

2.2 Site Layout and Features

Access to the site is via Euroka Road, which forms the western boundary of the development site. The site is fully fenced from the road and from surrounding properties.

A map showing Lot 1 and Lot 2 in DP 1039488 is presented as *Figure 2* of *Annex A*. The total area of the site is approximately 425 ha. Lot 1 in DP 1039488 has a total area of approximately 22 ha and Lot 2 in DP 1039488 has a total area of approximately 403 ha.

The primary features at the site are several excavations created during the operation of a sand extraction quarry at the site from 1988 to 2006. The approved development allows for the systematic filling of these excavations with approved inert waste.

The land immediately surrounding the waste disposal facility is currently used for dryland cropping and grazing purposes. Those areas of the site not affected by previous sand extraction activities are classified as predominately cleared pasture improved grazing land cultivated for agriculture. There are some individual trees and small clumps of remnant vegetation within the site. The majority of groundcover species are exotics that have been introduced such as Wheat (*Triticum* species), Barley (*Hordeum* species) and Lucerne (*Medicago sativa*), and either cropped or heavily grazed in pasture improvement programs.

2.3 Site Topography

The site exhibits broadly flat topography, and is associated with a historic alluvial floodplain. The 2007 NSW Department of Lands topographic map indicates the average elevation of the site is approximately 240m above the Australian Height Datum (AHD) and the average gradient is approximately 0.002 toward the west south west.

There are no natural rocky outcrops which would act to alter or restrict surface water flows within the development site. Earth embankments are located around the perimeter of the former sand extraction excavations. These embankments act to divert surface water around the open excavations.

There are no obvious drainage lines across the development site. Surface water has been observed to pool in low points across the surrounding alluvial plains after heavy rainfall events. The nearest

defined water course is Mile Post Creek, which is located adjacent to the western and southern site boundaries, approximately 100m from the nearest waste disposal excavation.

2.4 Soils, Geology and Hydrogeology

The *Cootamundra Geological Series Sheet SI/55-11 (1996)* indicates that the site is underlain by Quaternary Alluvium which is described as *'gravel, sand, silt and clay'*.

The geological map does not provide any clear guidance on the geological features underlying the alluvium.

The Impax Group conducted a search of the NSW Department of Water and Energy online database for registered bores located within 5000m of the site. The search was conducted on 3 April 2009. A total of 12 registered groundwater bores were identified within 5000 m of the site. The location of groundwater bores relative to the site are shown in *Figure 3* of *Annex A*. A summary of bore information obtained from the NSW Department of Water and Energy database is presented in *Table 2*.

The available information indicates that there are at least three primary aquifers underlying the area surrounding the site. The Impax Group's interpretation of these aquifers is summarised below:

1. Exposed or shallow sand seams are sparsely located across the alluvial plains. These sand seams are likely to be remnants of former surface water flow regimes underlain by less permeable clayey and silty material. These sand seams may form shallow (<10m below ground level), unconsolidated, localised aquifers, with water bearing zones generally less than 10 m below ground level. They are likely to be recharged from rainfall falling within a close proximity to the sand seam. These aquifers are unlikely to be extensive or continuous and standing water levels are likely to fluctuate with seasonal conditions. Only one of the registered groundwater bore (GW703251) identified in the search is likely to draw water from a shallow sandy aquifer.

2. The unconsolidated Lachlan Valley alluvium appears to form a regional scale aquifer or aquifers. Groundwater bores indicate groundwater bearing zones ranging from 71m to 113m below ground level. This is an extensive aquifer underlying the Quandialla region. Groundwater bore work summaries indicate that ten bores located within 5000 m of the development site access water from this aquifer(s).

3. Groundwater is also encountered in bedrock underlying the alluvial plains. Groundwater bore work summaries indicate that groundwater bearing fractured rock aquifer(s) have been encountered at depths raging between 93 m and 157 m. Groundwater bore work summaries indicate that five bores located within 5000 m of the development site access water from fractured rock aquifer(s).

Based on the information contained within the driller's logs held by the NSW Department of Water and Energy, groundwater is likely to reside in the permeable sand seams that are present in the landscape, and (if present) would be confined from the deeper regional alluvial aquifer(s) by the surrounding less permeable soils.

Table 2: Groundwater Bore Summaries

Bore ID	Licensed Activities	Easting	Northing	Drilled Depth (m)	Water Bearing Zones (m)	Water Bearing Zone Type	Salinity (ppm)	Drillers Log Summary
GW014865	Stock and Domestic	568392	6224786	119.50	75 113	Unconsolidated Unconsolidated	1001-3000	Clays, sand and rock bars, clay water supply, silt, rock
GW025109	Stock and Domestic	568025	6224790	114.00	110	Fractured Rock	1001-3000	Clay with sand bands, slate water supply
GW025116	Stock and Domestic,	569461	6221621	105.2	71 101	Unconsolidated, Fractured Rock	1000	Clay, clay and sand bands water supply, slate water supply
GW031110	Stock and Domestic	567084	6225797	85.30	81	Unconsolidated	n/a	Clay, silty clay, sandy clay water supply
GW033542	Stock	569625	6223651	97.50	Dry	n/a	n/a	(Unknown)
GW036632	Monitoring Bore	572627	6222506	115.00	84 98 103	Unconsolidated Unconsolidated Unconsolidated	n/a	Clay, banded clay water supply, shale
GW039378	Town Water Supply	565829	6221830	102.00	80	Unconsolidated	n/a	Clay, Gritty/Sandy Clay, Clay water supply, Shale
GW701754	Stock and Domestic	564890	6229560	115.00	93 107	Fractured Rock Fractured Rock	n/a	Clay, shale water supply
GW701755	Stock and Domestic	566458	6222790	110.00	90	Unconsolidated	n/a	Sand, clay, sand, clay, coarse sand water supply
GW701756	Stock and Domestic	570945	6226660	180.40	146 157	Fractured Rock Fractured Rock	Good	Clay, clay bound sand, granite water supply
GW702720	Stock and Domestic	564659	6227413	145.00	100 136	Fractured Rock Fractured Rock	n/a	Clay, clay bound sand, weathered shale, shale water supply
GW703251	Stock and Domestic	569575	6228005	4.50	(Unknown)	n/a	n/a	(Unknown)

3 Management of Groundwater Quality

The following sections describe potential impacts to groundwater quality from operation of the waste disposal facility. It also outlines environmental controls that will be implemented to minimise risks to groundwater quality.

3.1 Leachate

The NSW EPA (1996) *Environmental Guidelines: Solid Waste Landfills* defines leachate as *"the liquid that percolated through landfills as a result of infiltration and/or decomposition of waste"*.

Leachate generation and infiltration is the most significant potential threat to groundwater quality at operating landfill sites. However, the potential for leachate to be generated at the waste disposal facility is very low as the facility is only permitted to accept 'inert waste'.

The NSW EPA (1996) *Environmental Guidelines: Solid Waste Landfills* states:

> *The types of waste received at a landfill determine the potential pollutants that can be generated and hence the potential environmental risk. If a landfill is only receiving relatively inert materials such as building and demolition wastes which have no potentially hazardous characteristics, the potential environmental impacts are generally restricted to dust, noise and sedimentation, which can be readily controlled.*

In this paragraph the NSW EPA does not list leachate as a potential environmental impact from an inert waste landfill.

The NSW EPA (1996) *Environmental Guidelines: Solid Waste Landfills* defines 'inert waste' as *"waste which does not undergo environmentally significant physical, chemical or biologically transformations and has no potentially hazardous content once landfilled"*.

3.1.1 Leachate Controls

The waste disposal facility will be operated in accordance with the conditions of development consent specified by Bland Shire Council. Condition C1 of the conditions of consent states the following:

> *A maximum of 10,000 tonnes of waste per annum shall be accepted at the site, of this, the disposal of tyres is limited to 5,000 tonnes. Further development consent shall be required should the amount of waste exceed this limit.*
>
> *The Applicant shall only receive and dispose of the following solid waste on the site:*
>
> - *Virgin excavated natural material (clay, gravel, sand, soil and rock);*
> - *Building and demolition waste (bricks, concrete and timber); and*
> - *Used, rejected and unwanted tyres (including shredded tyres and tyre pieces).*
>
> *No other waste products are to be received and disposed of as part of this consent.*

Under the NSW EPA (1994) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* these waste types are classed as *'Inert Waste'*.

Whilst the potential for leachate generation at the site is very low the waste disposal cells will be designed in a manner which minimises potential for leachate to impact on groundwater quality. Prior to being used, each excavation will be lined with a re-compacted clay liner at least 900mm

thick with a certified in-situ permeability of less than $10^{-9}ms^{-1}$. The clay lined waste disposal cells will be inspected by Bland Shire Council prior to the commencement of waste disposal activities.

Uncontrolled surface water entering landfill excavation sites can lead to the excessive generation of leachate. The existing earth embankments surrounding the proposed waste disposal cells will be maintained during operation of the waste disposal facility. The embankments will divert water around the active waste disposal areas, controlling the surface water and preventing it from entering the excavations.

Figure 4 of *Annex A* shows an example of a pre-existing embankment at the development site.

At the completion of waste disposal activities each cell will be capped to minimise potential surface water infiltration. The capping will be installed in accordance with condition C4(e) of the conditions of consent, which states that the applicant shall:

> *"progressively cap landfill cells with a seal bearing surface and revegetation layer once they reach their final design height"*

3.2 Stormwater Recharge

Stormwater recharge has the potential to impact on water quality at the waste disposal facility. Stormwater recharge at landfill sites can cause unacceptable sediment loads into downstream catchments and has potential to impact on groundwater quality, albeit low.

3.2.1 Stormwater Controls

All approved inert waste deposited at the site will be covered as soon as practicable once each landfill cell is completed. The capping of the landfill cells once they are completed will minimise the potential for surface water run-off to carry waste-generated sediment off site.

In addition, as previously stated, the excavations are surrounded by topsoil and overburden embankments which will divert surface stormwater around the excavations. This will minimise the potential for landfill sediments to migrate offsite into downstream catchments.

3.3 Chemical Spills

The operation of machinery and vehicles at the waste disposal facility may result in a fuel or chemical spill which would have the potential to impact on groundwater quality.

3.3.1 Chemical Spill Controls

All mechanical equipment used at the waste disposal facility will be inspected regularly and properly maintained to minimise the chance of mechanical failure that could result in the loss of fuel or oil. In addition, spill control kits will be stored within each vehicle operating within the active waste disposal excavation areas.

There will be no permanent storage of fuel or other chemicals within or immediately adjacent to the pre-existing excavation areas. All refuelling of machinery, vehicles and equipment used at the site will be refuelled from fuel carts brought onto the site as required. In addition, all refuelling and mechanical repair work will take place within a designated bund area away from the pre-existing excavations. Spill control kits will be stored in this area and staff will be trained in the effective use of spill control kits.

3.4 Summary of Groundwater Quality Protection Controls

A summary of the environmental controls that will be implemented at the waste disposal facility to minimise the risk of groundwater contamination is presented in *Table 3*.

Table 3: Groundwater Quality Protection Controls

Potential Groundwater Risk	Control to be Implemented
Leachate	• Waste disposal facility to accept permitted 'inert waste' types only. • Compacted clay liner to be installed on bottom of waste disposal cells. Bland Shire Council to inspect each lined waste disposal cell prior to the commencement of filling. • Earth embankments surrounding waste disposal cells to be maintained. • Waste disposal cells to be capped when full.
Stormwater Recharge	• Earth embankments surrounding waste disposal cells to be maintained. • Waste disposal cells to be capped when full.
Chemical Contamination	• No permanent storage of fuel at the site. • Refuelling and vehicle maintenance to be undertaken in designated area away from waste disposal cells or off site (where possible). • Vehicles and machinery to be maintained regularly to minimise potential for leaks and spills. • Spill kits to be stored on site adjacent to designated refuelling and mechanical repairs area. • Waste disposal facility staff to be trained in spill containment and remediation.

4 Monitoring and Evaluation

Monitoring and evaluation is required to ensure that the implemented groundwater management controls are effective and improved where necessary.

4.1 Incoming Waste Monitoring

Waste stream monitoring and recording is required under Condition B3 and Condition C3 of the conditions of development consent for the waste disposal facility. Condition B3 of the conditions of consent states the following:

> *The Applicant shall implement suitable procedures to:*
>
> - *Ensure that the site does not accept wastes that are not permitted as part of this consent; and*
> - *Screen incoming waste loads.*

Condition C3 of the conditions of consent states the following:

> *The applicant shall keep accurate records of the:*
>
> *(a) Quantity, type and source of waste received, processed and disposed of on site; and*
>
> *(b) Volume of landfill space consumed.*

The incoming waste will be screened and recorded in accordance with these conditions. The waste records will be maintained at the site office and made available for Council inspection during operating hours.

The total weight of waste accepted at the facility should be tabulated and checked on a weekly basis to ensure that the facility does not accept more than 10 000 tonnes of waste in total per annum, or 5 000 tonnes of tyres per annum.

4.2 Waste Cell Construction

In accordance with Condition C2, waste disposal cells are to be lined with clay prior to filling. The clay lined pits are to be inspected by Bland Shire Council prior to the commencement of filling.

Earth embankments around the perimeter of each waste disposal cell will be inspected and maintained on a monthly basis to ensure they are effective at preventing the ingress of stormwater.

4.3 Baseline Groundwater Monitoring

There is currently one groundwater bore installed at the site, which is registered as GW014865. The bore is constructed within the Lachlan Valley alluvium aquifer, which appears to form a regional scale aquifer that underlies the development site. This bore intercepts water bearing zones at 75 m and 113 m below ground level.

In order to establish baseline water quality at the development site, groundwater samples will be collected from this bore prior to waste disposal activities commencing at the site. Physical groundwater parameters such as pH, Electrical Conductivity and temperature will be measured in the field. Groundwater samples will be analysed in a National Association of Testing Authorities (NATA) laboratory for the following analytes:

- Total petroleum hydrocarbons (TPH);
- Benzene toluene, ethyl benzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Phenols; and
- Priority heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc).

The results of the baseline monitoring should be kept at the site office and reported to Bland Shire Council.

4.4 Ongoing Groundwater Monitoring

The waste disposal facility poses very low risk to groundwater quality. The implementation of the groundwater quality protection controls described in *Section 3* further reduces this risk of groundwater contamination at the site. In order to ensure that the development is not contaminating groundwater at the development site the existing groundwater bore at the site (GW 014865) will be monitored every three (3) years. Samples will be analysed for the same suite of contaminants as outlined in *Section 4.3*.

The results of 3-yearly groundwater monitoring will be assessed against the baseline monitoring results. The results will be reported to Bland Shire Council.

4.5 Evaluation and Review

The results of monitoring outlined in *Sections 4.1 to 4.2* will be reviewed as they become available. Any identified deficiencies in the environmental controls will be rectified immediately. If necessary, site operational procedures, and this GMP will be updated and resubmitted to Bland Shire Council.

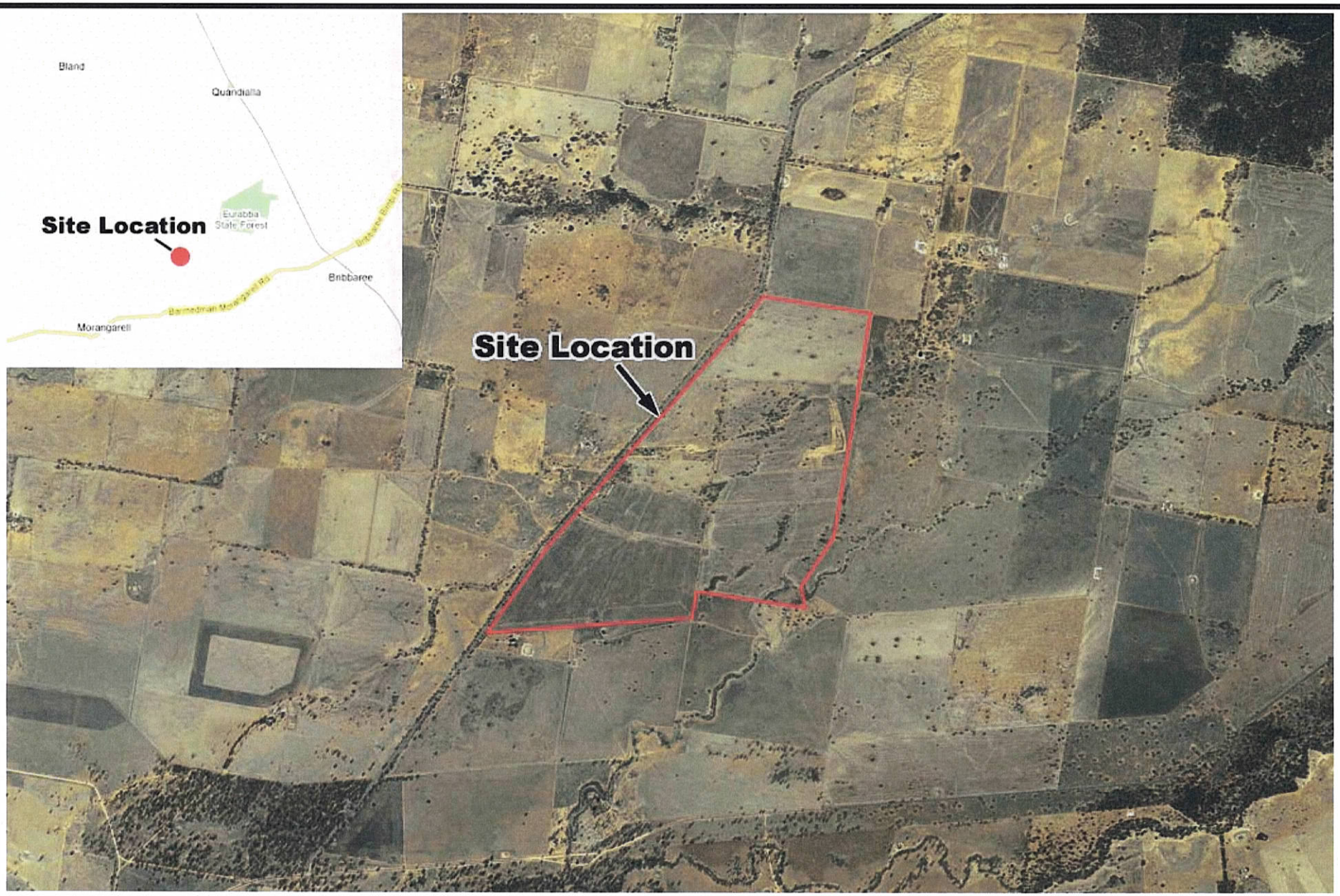
5 Conclusions

This GMP outlines potential risks to groundwater quality posed by the operation of the waste disposal facility and procedures and controls that will be implemented to reduce these risks to an acceptable level. The potential risk to groundwater quality posed by the waste disposal facility is very low, and the environmental controls proposed in this GMP further reduce those risks. If the identified environmental controls are implemented in accordance to this GMP groundwater users and the environment should not be adversely affected by the operation of the waste disposal facility.

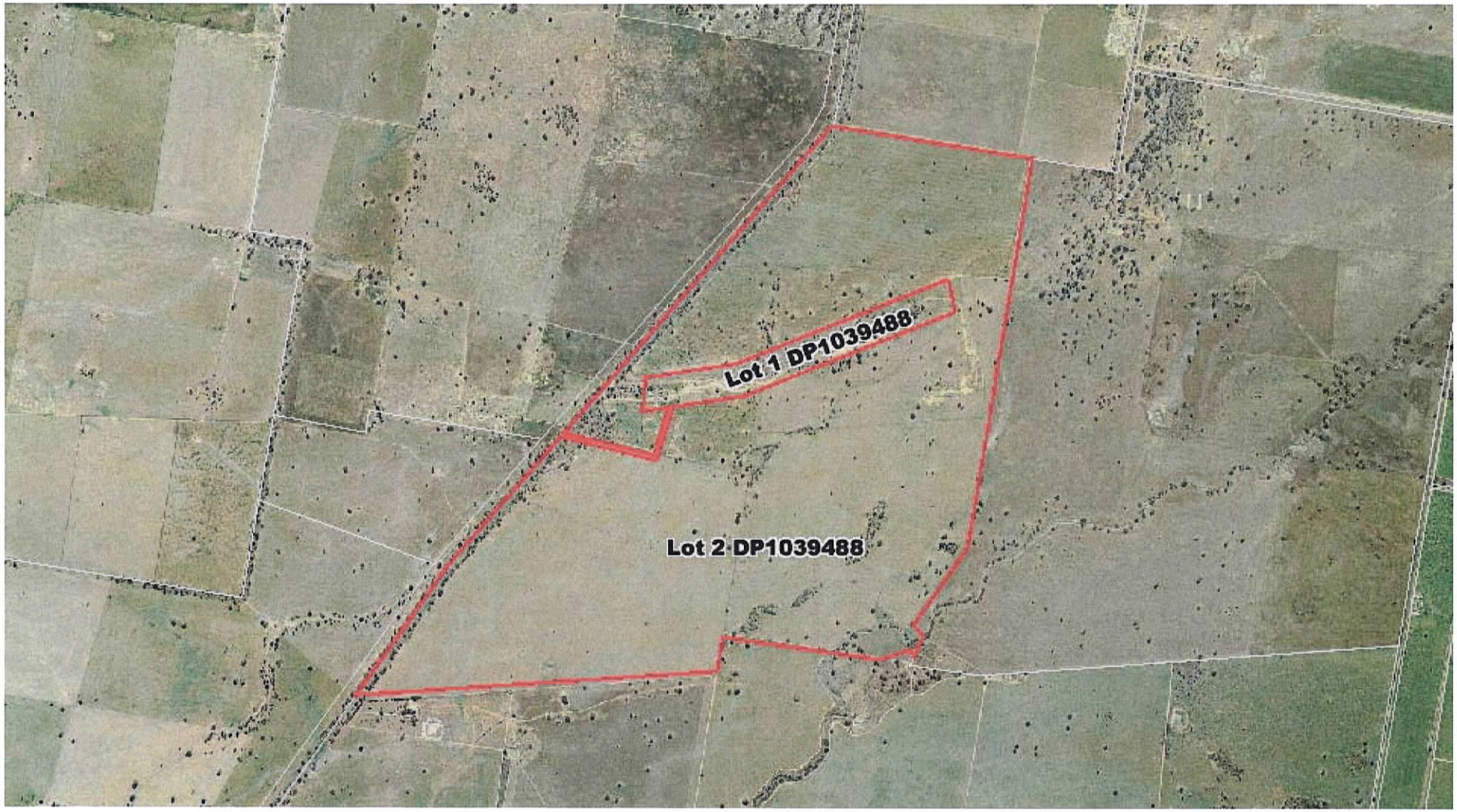
Waste disposal facility operations will be monitored by the facility owner and Bland Shire Council. The results of monitoring will be evaluated as they become available. Any identified deficiencies in the environmental controls will be rectified immediately. If necessary, site operational procedures, and this GMP will be updated and resubmitted to Bland Shire Council.

Annex A:

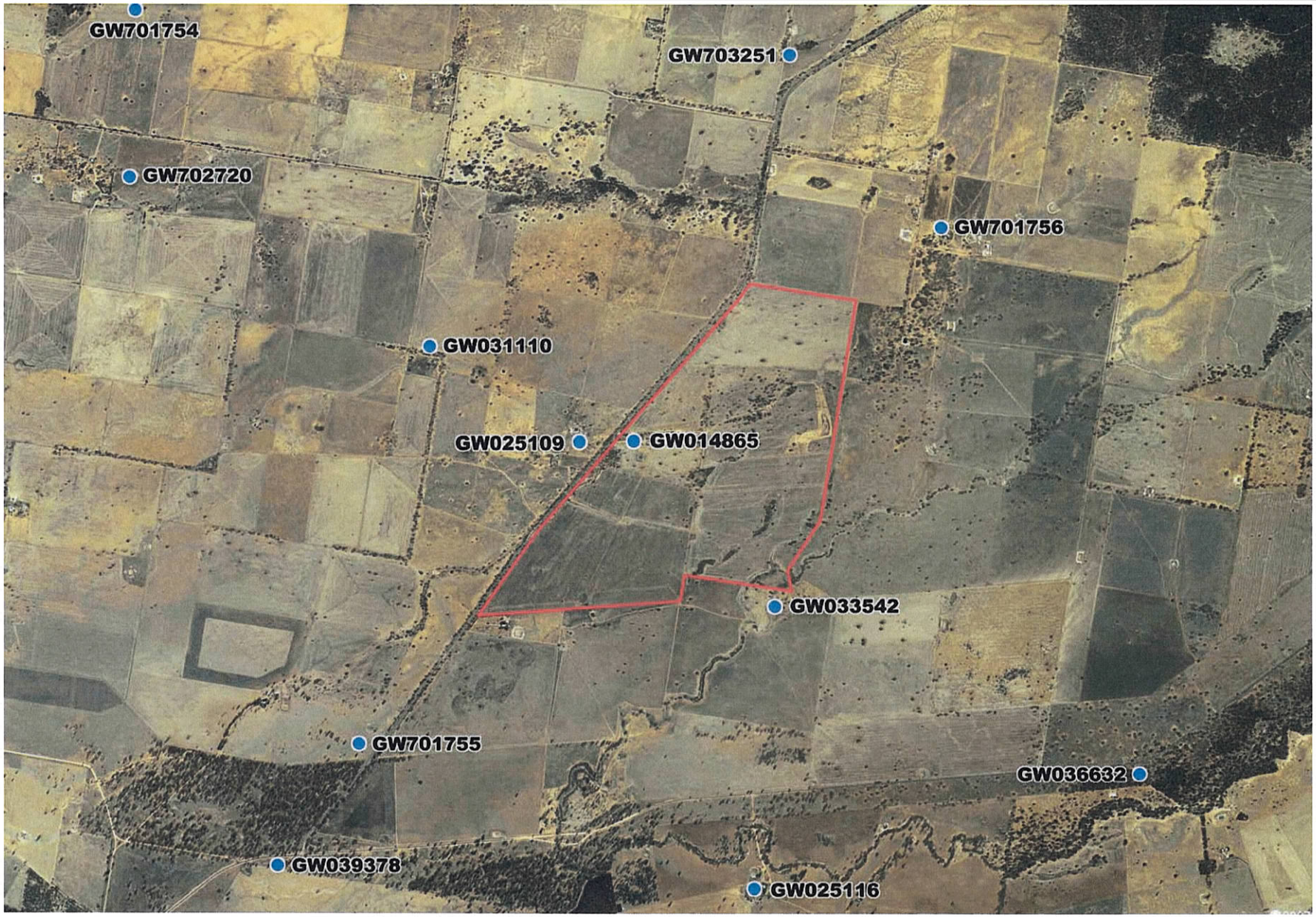
Figures



IMPAX group	Project Name: Groundwater Management Plan Waste Disposal Facility, Quandialla, NSW	Figure 1
	Project Number: 2009-0005	Site Location



IMPAX group	Project Name: Groundwater Management Plan Waste Disposal Facility, Quandialla, NSW	Figure 2
	Project Number: 2009-0005	Cadastral Map Showing "Yeronga"



IMPAX group	Project Name: Groundwater Management Plan Waste Disposal Facility, Quandialla, NSW	Figure 3
	Project Number: 2009-0005	Registered Groundwater Bores Located Within 5000m of "Yeronga"

IMPAX group	Project Name: Groundwater Management Plan Waste Disposal Facility, Quandialla, NSW	Figure 4
	Project Number: 2009-0005	Example of Earth Embankment Used to Control Surface Water

ATTACHMENT 10: GROUNDWATER MONITORING DATA 2010 & 2014

IMPAX group
ABN: 59 121 986 089

Lot 100 Williams Circuit
PO Box 6157
Dubbo NSW 2830

Ph: (02) 6885 5536
Fx: (02) 6885 3382

19 October 2010

Mr Craig Burns
42 Old Bowman Road
CARTWRIGHTS HILL
NSW 2650

Dear Craig,

RE: BASELINE GROUNDWATER MONITORING DATA
WASTE DISPOSAL FACILITY - "YERONGA", QUANDIALLA, NSW

The Impax Group was commissioned by Mr Craig Burns to conduct baseline groundwater monitoring at a waste management facility located at "Yeronga", Quandialla, NSW. Groundwater monitoring was conducted in accordance with *Section 4.3* of the Groundwater Management Plan for the facility (The Impax Group, 2009) and as required by the Bland Shire Council conditions of consent for the facility.

Groundwater monitoring works were conducted by Mr James Morrow on 28 September 2010. The subject bore (GW014865) was fitted with a permanent submersible pump. The bore was pumped for a period of approximately 40 minutes prior to sampling at a rate of approximately 0.5L/sec. Water quality parameters were measured at regular intervals during well purging to assess any changes in groundwater chemistry and to ensure the bore had been adequately purged prior to sampling. The water quality parameters recorded during purging are presented in *Table 1*.

Table 1: Water Quality Parameters - GW014865

Purge Time	Dissolved Oxygen (ppm)	Electrical Conductivity (uS/cm)	pH	Redox Potential (mV)	Temperature (°C)
30min	1.00	2640	7.03	-66	21.3
35min	0.80	2640	7.10	-79	21.1
40min	1.06	2650	7.14	-77	21.3

Groundwater samples were collected after the well had been purged for a period of 40 minutes. As shown in *Table 1*, field parameters were relatively stable prior to sampling indicating the groundwater sampled was indicative of conditions within the alluvium surrounding the well screen.

Groundwater samples were collected directly from the pump outlet. The Impax Group collected samples in the appropriate laboratory supplied containers with appropriate preservatives where needed. The sample for dissolved heavy metals analysis was filtered in the field using a new disposable filter. Groundwater samples were placed in an ice filled esky immediately after collection.

Groundwater samples were transported to MGT LabMark Environmental Laboratories (LabMark) in Sydney for analysis. Sampling details and the required analysis was documented on a chain of custody form, which accompanied the samples in transit.

Groundwater samples were analysed for the analytes listed in the Groundwater Management Plan which are:

- Total Petroleum Hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene and total xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Phenols; and
- Priority heavy Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc).

Groundwater analysis was performed by LabMark using NATA accredited analytical methods.

Laboratory Analytical Results are presented as Attachment A.

Reported concentrations of TPH, BTEX, PAHs and phenols in the groundwater sample were less than the estimated quantification limit (EQL). Reported concentrations of arsenic, cadmium, chromium, copper, lead, nickel and mercury were also less than the EQL. The reported concentration of zinc was 0.011mg/L.

If you have any questions regarding the information provided in this letter or any other issues please contact the undersigned on 0447 674 927.

Kind Regards

James Morrow
Environmental Engineer
The Impax Group

2010-1014 Yeronga GW L1

Attachments

Attachment A - Groundwater Analytical Results

Attachment A:

Groundwater Analytical Results

mgt LabMark
ENVIRONMENTAL LABORATORIES

ilac-MRA NATA
Accreditation No 1845

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	**E050360**	**Cover Page 1 of 3 plus Sample Results**
Client Name:	The Impax Group	
Client Reference:	Burns Sand - Yeronga	
Contact Name:	James Morrow	
Chain of Custody No:	2010-1014-1	**Date Received: 30/09/2010**
Sample Matrix:	WATER	**Date Reported: 08/10/2010**

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs: batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material	
not applicable	r:	RPD relative % difference	mb:	method blank	

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

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

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

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

mgt LabMark
ENVIRONMENTAL LABORATORIES

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

Environmental Laboratory Industry Group
Foundation Member

Laboratory Report: E050360

Cover Page 2 of 3

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 1645.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.
Reported by mgt LabMark Environmental Melbourne, NATA accreditation No. 1645.

Laboratory Report: E050360

Cover Page 3 of 3

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

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	1	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	1	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	1	0	0%	0	0	0%
3	Polyaromatic Hydrocarbons (PAH)	1	0	0%	0	0	0%
4	Phenols by GC/MS	1	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

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

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E050360
Client Name: The Impax Group
Contact Name: James Morrow
Client Reference: Burns Sand - Yeronga 2010-1014

Date: 08/10/10
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		279488	lcs	mb							
Sample Identification		GW014865	QC	QC							
Depth (m)		–	–	–							
Sampling Date recorded on COC		28/9/10	–	–							
Laboratory Extraction (Preparation) Date		1/10/10	1/10/10	1/10/10							
Laboratory Analysis Date		2/10/10	1/10/10	1/10/10							
Method : E029.1/E016.1											
BTEX by P&T	**EQL**										
Benzene	1	<1	94%	<1							
Toluene	1	<1	91%	<1							
Ethylbenzene	1	<1	92%	<1							
meta- & para-Xylene	2	<2	94%	<2							
ortho-Xylene	1	<1	96%	<1							
Total Xylene	–	–	–	–							
4-BFB (Surr @ 50ug/l)	–	*97%*	*98%*	*99%*							
Method : E029.1/E016.1											
Volatile TPH by P&T (vTPH)	**EQL**										
C6-C9	50	<50	80%	<50							

Results expressed in ug/l unless otherwise specified

Comments:

E029.1/E016.1: Direct injection into P&T/GC/FID/MSD.
E029.1/E016.1: Direct injection into P&T/GC/MSD.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E050360
Client Name: The Impax Group
Contact Name: James Morrow
Client Reference: Burns Sand - Yeronga 2010-1014

plus cover page
Date: 08/10/10
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		279488	lcs	mb							
Sample Identification		GW014865	QC	QC							
Depth (m)		–	–	–							
Sampling Date recorded on COC		28/9/10	–	–							
Laboratory Extraction (Preparation) Date		1/10/10	1/10/10	1/10/10							
Laboratory Analysis Date		5/10/10	5/10/10	5/10/10							
Method : E004.1											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10-C14 Fraction	50	<50	–	<50							
C15-C28 Fraction	200	<200	86%	<200							
C29-C36 Fraction	50	<50	–	<50							
Sum of TPH C10 - C36	–	–	–	–							

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E050360 | **Page:** 3 of 4 | Final
Client Name: The Impax Group | plus cover page | **Certificate**
Contact Name: James Morrow | **Date:** 08/10/10 | of Analysis
Client Reference: Burns Sand - Yeronga 2010-1014 | This report supercedes reports issued on: N/A

Laboratory Identification		279488	lcs	mb							
Sample Identification		GW014865	QC	QC							
Depth (m)		–	–	–							
Sampling Date recorded on COC		28/9/10	–	–							
Laboratory Extraction (Preparation) Date		1/10/10	1/10/10	1/10/10							
Laboratory Analysis Date		6/10/10	6/10/10	6/10/10							
Method : E007.1											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	1	<1	78%	<1							
Acenaphthylene	1	<1	82%	<1							
Acenaphthene	1	<1	83%	<1							
Fluorene	1	<1	89%	<1							
Phenanthrene	1	<1	92%	<1							
Anthracene	1	<1	89%	<1							
Fluoranthene	1	<1	90%	<1							
Pyrene	1	<1	92%	<1							
Benz(a)anthracene	1	<1	89%	<1							
Chrysene	1	<1	73%	<1							
Benzo(b)&(k)fluoranthene	2	<2	88%	<2							
Benzo(a) pyrene	1	<1	89%	<1							
Indeno(1,2,3-c,d)pyrene	1	<1	83%	<1							
Dibenz(a,h)anthracene	1	<1	70%	<1							
Benzo(g,h,i)perylene	1	<1	89%	<1							
Sum of reported PAHs	–	–	–	–							
2-FBP (Surr @ 250ug/l)	–	*72%*	*78%*	*81%*							
TP-d14 (Surr @ 250ug/l)	–	*97%*	*104%*	*108%*							

Results expressed in ug/l unless otherwise specified

Comments:

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

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Laboratory Report No: E050360 | **Page:** 4 of 4 | Final
Client Name: The Impax Group | plus cover page | **Certificate**
Contact Name: James Morrow | **Date:** 08/10/10 | of Analysis
Client Reference: Burns Sand - Yeronga 2010-1014 | This report supercedes reports issued on: N/A

Laboratory Identification		279488	lcs	mb							
Sample Identification		GW014865	QC	QC							
Depth (m)		–	–	–							
Sampling Date recorded on COC		28/9/10	–	–							
Laboratory Extraction (Preparation) Date		1/10/10	1/10/10	1/10/10							
Laboratory Analysis Date		7/10/10	7/10/10	7/10/10							
Method : E008.1											
Phenols by GC/MS	**EQL**										
Phenol	2	<2	95%	<2							
2-chlorophenol	2	<2	94%	<2							
2-methylphenol	2	<2	95%	<2							
3-&4-methylphenol	4	<4	95%	<4							
2-nitrophenol	2	<2	86%	<2							
2,4-dimethylphenol	2	<2	92%	<2							
2,4-dichlorophenol	2	<2	93%	<2							
4-chloro-3-methylphenol	2	<2	97%	<2							
2,4,6-trichlorophenol	2	<2	94%	<2							
2,4,5-trichlorophenol	2	<2	92%	<2							
Pentachlorophenol	10	<10	117%	<10							
Sum of reported phenols	–	–	–	–							
2-FP (Surr @ 40ug/l)	–	*81%*	*94%*	*92%*							
Phenol-d5 (Surr @ 40ug/l)	–	*83%*	*93%*	*92%*							
2,4,6-TBP (Surr @ 40ug/l)	–	*87%*	*110%*	*100%*							

Results expressed in ug/l unless otherwise specified

Comments:

E008.1: Triple acidic extraction with DCM. Analysis by GC/MS.

mgt LabMark
ENVIRONMENTAL LABORATORIES

Certificate of Analysis

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

Attention: Ryan Hamilton

Project	278614
Client Reference	E050360
Received Date	Oct 04, 2010

Client Sample ID			GW014865
Sample Matrix			Water
mgt-LabMark Sample No.			10-Oc20581
Date Sampled			Sep 28, 2010
Test/Reference	PQL	Unit	
Metals (8) filtered			
Arsenic (filtered)	0.005	mg/L	< 0.005
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.005	mg/L	< 0.005
Copper (filtered)	0.005	mg/L	< 0.005
Lead (filtered)	0.005	mg/L	< 0.005
Nickel (filtered)	0.005	mg/L	< 0.005
Zinc (filtered)	0.005	mg/L	0.011
Mercury (filtered)	0.0001	mg/L	< 0.0001

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Sample History

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

Description	Testing Site	Extracted	Holding Time
Metals (8) filtered - Method: LM-LTM-MET-3100	Clayton	Oct 04, 2010	1 Month

mgt-LabMark 1868 Dandenong Rd, Clayton, VIC Australia 3168
ABN : 50 005 085 521 Telephone: +61 3 9265 9300 Facsimile: +61 3 9265 9355

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mgt-LabMark Internal Quality Control Review

General

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

Holding Times

Please refer to 'Sampling and Preservation Chart for Soils & Waters' for holding times. (LM-FOR-ADM-020)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitability qualified results may still be reported.

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

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

UNITS

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

TERMS

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

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

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

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Metals (S) filtered LM-LTM-MET-3100							
Arsenic (filtered)	mg/L	< 0.005			0.005	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.005			0.005	Pass	
Copper (filtered)	mg/L	< 0.005			0.005	Pass	
Lead (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
LCS - % Recovery							
Metals (S) filtered LM-LTM-MET-3100		Result 1					
Arsenic (filtered)	%	107			70-130	Pass	
Cadmium (filtered)	%	104			70-130	Pass	
Chromium (filtered)	%	99			70-130	Pass	
Copper (filtered)	%	103			70-130	Pass	
Lead (filtered)	%	109			70-130	Pass	
Nickel (filtered)	%	101			70-130	Pass	
Zinc (filtered)	%	105			70-130	Pass	
Mercury (filtered)	%	95			70-130	Pass	
[Duplicate of 18-Oct2010 - BATCH]							
Metals (S) filtered		Result 1	Result 2	RPD			
Arsenic (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Cadmium (filtered)	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Copper (filtered)	mg/L	< 0.005	< 0.005	4.0	30%	Pass	
Lead (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	mg/L	< 0.005	< 0.005	3.0	30%	Pass	
Mercury (filtered)	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
[Spike of 18-Oct2010] - % Recovery							
Metals (S) filtered		Result 1					
Cadmium (filtered)	%	115			70 - 130	Pass	
Chromium (filtered)	%	109			70 - 130	Pass	
Copper (filtered)	%	105			70 - 130	Pass	
Lead (filtered)	%	104			70 - 130	Pass	
Nickel (filtered)	%	106			70 - 130	Pass	
Zinc (filtered)	%	108			70 - 130	Pass	
Mercury (filtered)	%	94			70 - 130	Pass	

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Comments

Sample Integrity

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

Authorised By

Glenn Jackson

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

mgt LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 30/09/2010
Report Time : 3:49:13PM

Sample Receipt Notice (SRN) for E050360

Quality, Service, Support

Client Details		Laboratory Reference Information	
Client Name:	The Impax Group	Please have this information ready when contacting MGT Labmark.	
Client Phone:	02 6885 5536		
Client Fax:	02 6885 3382	Laboratory Report:	E050360
Contact Name:	James Morrow	Quotation Number:	Q0594.ES
Contact Email:	james@theimpaxgroup.com.au	Laboratory Address:	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	PO BOX 6157 Dubbo, NSW 2830	Phone:	61 2 9476 6533
		Fax:	61 2 9476 8219
Project Name:	Burns Sand - Yeronga	Sample Receipt Contact:	Leanne Knowles
Project Number:	2010-1014	Email:	leanne.knowles@labmark.com.au
CoC Serial Number:	2010-1014-1	Reporting Contact:	Leanne Knowles
Purchase Order:	2010-1014-1	Email:	leanne.knowles@labmark.com.au
Surcharge:	No surcharge applied (results by 6:30pm on due date)		
Sample Matrix:	WATER		
Date Sampled (earliest date):	28/09/2010	NATA Accreditation:	13542
Date Samples Received:	30/09/2010		
Date Sample Receipt Notice Issued:	30/09/2010		
Date Preliminary Report Due:	08/10/2010		
Client TAT Request Date:	08/10/2010		

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 10EA11691

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

Comments: Phenols as Speciated and M8-Metals as Dissolved to reflect sample preservation, unless otherwise instructed

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

Preservation: Chemical preservation of samples satisfactory for requested analytes.

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

Analysis comments:

Subcontracted Analyses:
Reported by mgt LabMark Environmental Melbourne, NATA accreditation No. 1645.

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

mgt LabMark
ENVIRONMENTAL LABORATORIES

Report Date : 30/09/2010
Report Time : 3:49:13PM

Sample Receipt Notice (SRN) for E060360

Quality, Service, Support

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

GRID REVIEW TABLE										Requested Analysis													
No.	Date	Depth	Client Sample ID	BTEX by P&T	Filtered mercury	Filtered metals (M7)	Polyaromatic Hydrocarbons (PAH)	Phenols by GC/MS	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (VTPH)	External Analysis by MGT LabMark											
279488	28/09		GW014865	●	●	●	●	●	●	●	●	●											
			Totals:	1	1	1	1	1	1	1	1	1											

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

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

mgt LabMark
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Quality, Service, Support

Report Date : 30/09/2010
Report Time : 3:49:13PM

Sample Receipt Notice (SRN) for E050360

No.	Date	Depth	Client Sample ID	MB - M7-F_W	Requested Analysis
279488	28/09		GW014865	●	
			Totals:	1	

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

☐ MELBOURNE
Ph: (03) 9265 9300 · Fax: (03) 9265 9355
1868 Dandenong Road Clayton VIC 3168
E: enviro.melbourne@labmark.com.au

☐ BRISBANE
Ph: (07) 3902 4600 Fax: (07) 3902 4646
1/21 Smallwood Place Murarrie QLD 4172
E: enviro.brisbane@labmark.com.au

☑ SYDNEY
Ph: (02) 9476 6533 Fax: (02) 9476 8219
Unit 1/8 Leighton Place Asquith NSW 2077
E: enviro.sydney@labmark.com.au

Call: 1300 0 LABMARK

mgt LabMark ENVIRONMENTAL LABORATORIES

Environmental Analysis Request – Chain Of Custody (COC)

Company: THE IMPAX GROUP
Address: 100 Williams Cct
DUBBO NSW 2830
Contact: JAMES MORROW
Telephone: 0447 674 927 Fax:
Email: james@theimpaxgroup.com.au

Project Name: Burns Sand - Yeronga
COC Number*: 2010-1014-1
*The COC number will act as a purchase order number if not supplied
Project Number: 2010-1014
Quote Reference: Q0594.ES
Purchase Order No: 2010-1014-1
Send Results to: James Morrow (email)
Results Required by*: 24 hrs ☐ 48 hrs ☐ 5 Day ☑ Other ☐ Standard
* Note: TAT of less than 5 days must be pre-arranged with the laboratory and surcharges may apply.

SAMPLE DESCRIPTION					ANALYSIS REQUIRED																
Lab ID	Sample ID	Date & Time Sampled	Soil / Water Other	Comments#	COMPOSITE	TPH – C6-C9	TPH – C10-C36	MAHs	BTEX	PAHs	PCBs	OCs	OPs	Total Phenolics	Speciated Phenols	Metals – Std 17	Metals – Specify**	Mercury	NEPM 448.3 Screen	Phenols	M8-Metals
279488	Burns	28/9/10	Water			X	X		X	X										X	X
				Please change Sample ID to GW014865																	
# Please Provide Field PID Readings where possible				Totals:		1	1		1	1										1	1

** METALS (Please circle): Al; Sb; As; Ba; Be; Bi; B; Cd; Ca; Cs; Cr; Co; Cu; Fe; Pb; Li; Mg; Mn; Mo; Ni; Pd; P; Pt; K; Se; Si; Ag; Na; Sr; S; Tl; Th; Sn; Ti; W; U; V; Zn

Chain of Custody

Relinquished by:	[signature]	Date/Time:	29/9/10 13:00 [redacted]
Received by:	[signature]	Date/Time:	30/9/10 1000
Relinquished by:		Date/Time:	
Received by:		Date/Time:	
Relinquished by:		Date/Time:	
Received by:		Date/Time:	

Special Requirements (eg. OHS issues etc.)

Sample Receipt Advice (Lab Use Only)
All Samples Received in Good Condition ☑
All Documentation in Proper Order ☐
Samples Received with an Attempt to Chill ☐
Samples Received Within Holding Times ☐
Average sample temp on receipt (°C) 6.5
For enquires please quote Ref. No. E050360

DA /2007/083

Ground Doctor Pty Ltd

ABN: 32 160 178 656

22 Tamworth Street
PO Box 6278
DUBBO NSW 2830

Ph: 0407 875 302
Fax: (02) 8607 8122
admin@grounddoc.com.au

1 April 2014

Mr Craig Burns
42 Old Bowman Road
CARTWRIGHTS HILL
NSW 2650
cwgfburns@live.com

Dear Craig,

RE: GROUNDWATER MONITORING DATA – MARCH 2014
WASTE DISPOSAL FACILITY - "YERONGA", QUANDIALLA, NSW

Ground Doctor Pty Ltd (Ground Doctor) was commissioned by Mr Craig Burns to conduct groundwater monitoring at a waste management facility located at "Yeronga", Quandialla, NSW. Groundwater monitoring was conducted in accordance with *Section 4.3* of the Groundwater Management Plan for the facility (The Impax Group, 2009) and as required by the Bland Shire Council conditions of consent for the facility.

Groundwater monitoring works were conducted by Mr James Morrow on 22 March 2014. The subject bore (GW014865) was sampled using the permanently fitted submersible pump. The bore was purged prior to sampling for a period of approximately 60 minutes, at an average pumping rate of approximately 1.0L/sec. Monitoring of groundwater field parameters during baseline sampling works indicated that purging the well for this period of time was sufficient to provide a representative sample of groundwater.

Groundwater samples were collected directly from the pump outlet. Ground Doctor collected samples in appropriate laboratory supplied containers marked with the sample identification details. The sample to be analysed for dissolved metals was filtered in the field using a 45um disposable filter and placed into an acid preserved bottle. Groundwater samples were placed in an ice filled esky immediately after collection.

Groundwater samples were transported to Envirolab Services (Envirolab) in Sydney for analysis. Sampling details and the required analysis was documented on a chain of custody form, which accompanied the samples in transit.

Groundwater samples were analysed for the analytes listed in the Groundwater Management Plan (The Impax Group, 2009) which are:

- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Phenol; and

- Priority heavy Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc).

Groundwater analysis was performed by Envirolab using NATA accredited analytical methods.

Laboratory Analytical Results are presented as *Attachment A*.

Reported concentrations of TRH, BTEX, PAHs and phenol in the groundwater sample were less than the estimated quantification limits (EQLs). Reported concentrations of arsenic, cadmium, chromium, copper, lead, nickel and mercury were also less than the EQLs. The reported concentration of zinc was 0.004mg/L. The reported zinc concentration is considered indicative of background (naturally occurring) zinc within the Lower Lachlan Valley Alluvium groundwater management unit and is similar to reported concentrations in baseline and previous water quality monitoring events.

If you have any questions regarding the information provided in this letter please contact the undersigned on 0407 875 302.

Kind Regards,

James Morrow
Environmental Engineer

2014-GD007-L1

Attachment:

Attachment A – Laboratory Certificate of Analysis

Reference

The Impax Group (2009), *Groundwater Management Plan for Operation of Waste Disposal Facility at "Yeronga", Euroka Road Quandialla, NSW*, 10 June 2009.

Attachment A:

Laboratory Certificate of Analysis

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

SAMPLE RECEIPT ADVICE

Client:
Ground Doctor Pty Ltd
PO Box 6278
Dubbo NSW 2830

ph: 0407 875 302
Fax:

Attention: James Morrow

Sample log in details:

Your reference:	**Yeronga Groundwater Monitoring - 2014**
Envirolab Reference:	**107024**
Date received:	25/03/2014
Date results expected to be reported:	**1/04/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Water
Turnaround time requested:	Standard
Temperature on receipt (°C)	1.8
Cooling Method:	Ice
Sampling Date Provided:	YES

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

Contact details:
Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

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

CERTIFICATE OF ANALYSIS 107024

Client:
Ground Doctor Pty Ltd
PO Box 6278
Dubbo
NSW 2830

Attention: James Morrow

Sample log in details:

Your Reference:	**Yeronga Groundwater Monitoring - 2014**
No. of samples:	1 Water
Date samples received / completed instructions received	25/03/2014 / 25/03/2014

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

Report Details:

Date results requested by: / Issue Date:	1/04/14 / 1/04/14
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ---------- 	107024-1 GW014865 22/03/2014 Water
Date extracted	-	25/03/2014
Date analysed	-	26/03/2014
TRHC6 - C9	µg/L	<10
TRHC6 - C10	µg/L	<10
TRHC6 - C10 less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	95
Surrogate toluene-d8	%	95
Surrogate 4-BFB	%	101

svTRH (C10-C40) in Water		
Our Reference:	UNITS	107024-1
Your Reference	----------	GW014865
Date Sampled	----------	22/03/2014
Type of sample		Water
Date extracted	-	26/03/2014
Date analysed	-	27/03/2014
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
TRH>C$_{10}$ - C$_{16}$	µg/L	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	µg/L	<50
TRH>C$_{16}$ - C$_{34}$	µg/L	<100
TRH>C$_{34}$ - C$_{40}$	µg/L	<100
Surrogate o-Terphenyl	%	103

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ---------- 	107024-1 GW014865 22/03/2014 Water
Date extracted	-	26/03/2014
Date analysed	-	27/03/2014
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	102

Total Phenolics in Water		
Our Reference:	UNITS	107024-1
Your Reference	----------	GW014865
Date Sampled	----------	22/03/2014
Type of sample		Water
Date extracted	-	27/03/2014
Date analysed	-	27/03/2014
Total Phenolics (as Phenol)	mg/L	<0.05

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			25/03/2014	[NT]	[NT]	LCSW1	25/03/2014
Date analysed	-			26/03/2014	[NT]	[NT]	LCSW1	26/03/2014
TRHC6 - C9	µg/L	10	Org-016	<10	[NT]	[NT]	LCSW1	108%
TRHC6 - C10	µg/L	10	Org-016	<10	[NT]	[NT]	LCSW1	108%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCSW1	108%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCSW1	107%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCSW1	109%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCSW1	109%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCSW1	108%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	99	[NT]	[NT]	LCSW1	94%
Surrogate toluene-d8	%		Org-016	95	[NT]	[NT]	LCSW1	103%
Surrogate 4-BFB	%		Org-016	102	[NT]	[NT]	LCSW1	97%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			26/03/2014	[NT]	[NT]	LCS-W1	26/03/2014
Date analysed	-			27/03/2014	[NT]	[NT]	LCS-W1	27/03/2014
TRHC10 - C14	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	78%
TRHC15 - C28	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRHC29 - C36	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	139%
TRH>C10 - C16	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	78%
TRH>C16 - C34	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRH>C34 - C40	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	139%
Surrogate o-Terphenyl	%		Org-003	80	[NT]	[NT]	LCS-W1	68%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			26/03/2014	[NT]	[NT]	LCS-W1	26/03/2014
Date analysed	-			27/03/2014	[NT]	[NT]	LCS-W1	27/03/2014
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	100%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	113%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	109%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	108%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	112%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	104%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	118%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	81	[NT]	[NT]	LCS-W1	101%
QUALITY CONTROL Total Phenolics in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			27/03/2014	[NT]	[NT]	LCS-W1	27/03/2014
Date analysed	-			27/03/2014	[NT]	[NT]	LCS-W1	27/03/2014
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-030	<0.05	[NT]	[NT]	LCS-W1	87%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			26/03/2014	[NT]	[NT]	LCS-W1	26/03/2014
Date analysed	-			26/03/2014	[NT]	[NT]	LCS-W1	26/03/2014
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	99%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	101%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	101%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	97%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	96%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

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

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

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

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

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP

Client: Ground Doctor Pty Ltd	Client Project Name / Number / Site etc (ie report title): Yeronga Groundwater Monitoring - 2014
Contact person: James Morrow	PO No.: 2014-GD007-1
Project Mgr: James Morrow	Envirolab Quote No. :
Sampler: James Morrow	Date results required: Standard
Address: PO Box 6278, DUBBO, NSW 2830	Or choose: standard / same day / 1 day / 2 day / 3 day
	Note: Inform lab in advance if urgent turnaround is required - surcharge applies
Phone: -- Mob: 0407 875 302	Lab comments:
Fax: --	
Email: james.morrow@grounddoc.com.au	

Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Phone: 02 9910 6200 Fax :02 9910 6201
E-mail: ahie@envirolabservices.com.au
Contact: Aileen Hie

Envirolab Services WA t/a MPL
16-18 Hayden Crt, Myaree WA 6154
Phone: 08 9317 2505 Fax :08 9317 4163
E-mail: lab@mpl.com.au
Contact: Joshua Lim

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 4														Provide as much information about the sample as you can
1	GW014865	-	22-Mar-14	Water	x														

107024
25/3/14
9 30
PT

Relinquished by (company):	Ground Doctor Pty Ltd	Received by (company):	EL
Print Name:	James Morrow	Print Name:	PT
Date & Time:	24/03/2014 1500	Date & Time:	25/3/14 9 30
Signature:	JRM	Signature:	PT

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

APPENDIX D YERONGA LANDFILL REHABILITATION PLAN