senversa

Water Management Plan

reDirect Resource Recovery Facility – 24 Davis Road, Wetherill Park NSW

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Document Information

Water Management Plan,
reDirect Resource Recovery Facility – 24 Davis Road, Wetherill Park NSW

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Senversa acknowledges the traditional custodians of the land on which this work was created and pay our respect to Elders past and present.

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List of Acronyms

Acronym	Definition
ANZG	Australian and New Zealand Governments
AS	Australian Standard
ASS	Acid sulphate soil
AST	Aboveground storage tank
BOD	Biological Oxygen Demand
BoM	Bureau of Meteorology
BTEX	Benzene, toluene, ethylbenzene, xylenes
CEnvP (SC)	Certified Environmental Practitioner (Site Contamination)
COA	Conditions of Approval
COD	Chemical Oxygen Demand
DEC	Department of Environment and Conservation
DCP	Development Control Plan
DGV	Default Guideline Values
DO	Dissolved oxygen
DP	Deposited Plan
EC	Electrical conductivity
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
FCC	Fairfield City Council
FGO	Food and garden organics
FLD	Food and liquid de-packaging
GDE	Groundwater dependent ecosystems
HIL	Health-based investigation level

Acronym	Definition
HSL	Health screening level
kL	Kilolitre
kL/day	Kilolitre per day
km	Kilometre
km^2	Kilometres squared
L	Litre
LEP	Local Environment Plan
LGA	Local government area
LNAPL	Light non-aqueous phase liquid
LOR	Limit of reporting
m	Metre
m^2	Square metres
mm	millimetres
m AHD	Metres Australian Height Datum
m bgl	Metres below ground level
m btoc	Metres below top of casing
MGA	Map Grid Australia
mg/L	Milligrams per litre
mL	millilitres
mV	MilliVolt
MW	Monitoring well
NAPL	Non aqueous phase liquids
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NSW	New South Wales

Acronym	Definition
NUDLC	National Uniform Drillers Licensing Committee
NZS	New Zealand Standard
OCP	Organochlorine Pesticides
OEMP	Operational Environmental Management Plan
OPP	Organophosphate Pesticides
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyl
PCR	Primary Contact Recreation
POEO Act	Protection of the Environment Operations Act 1997
ppm	Parts per million
QA	Quality assurance
QC	Quality control
SEE	Statement of Environmental Effects
SSD	State Significant Development

Acronym	Definition
TDS	Total dissolved solids
TKN	Total kjeldahl nitrogen
TN	Total Nitrogen
TOC	Total organic carbon
tpa	Tonne per annum
TP	Total phosphorus
TPH	Total petroleum hydrocarbons
TSS	Total suspended solids
TWA	Trade Waste Agreement
UST	Underground storage tank
VENM	Virgin Excavated Natural Material
WHO	World Health Organisation
WMAA	Waste Management Association of Australia
WMP	Water Management Plan

1.0 Introduction and Objectives

1.1 General

Senversa Pty Ltd (Senversa) was engaged by Space Urban Pty Ltd (SU), on behalf of reDirect Recycling Pty Ltd (reDirect), to prepare a Water Management Plan (WMP) for the operation of Stage 1 of the reDirect Resource Recovery Facility located at 24 Davis Road, Wetherill Park, New South Wales (NSW) (the site).

The WMP is required as a sub-plan within the operational environmental management plan (OEMP), prepared by SU, for the operation of the facility under Stage 1 of the State Significant Development 7401 (SSD-7401).

The site location and layout is provided on **Figure 1**.

1.2 Document Context and Purpose

Bettergrow Pty Ltd (Bettergrow) is redeveloping the site into a resource recovery and recycling facility. The objective of the site operator, reDirect, is to recycle waste streams that have historically gone to landfill and to increase the amount of household waste that is recycled.

Approval for SSD-7401 permitted redevelopment of the site. Key works approved following the initial application and modifications submitted to the Department of Planning, Industry and Environment (DPIE) (and preceding NSW government planning agencies) for the site are listed in **Table 1.1**.

Table 1.1 SSD Application and Modifications for the Site

SSD Application / Modification	Key Works
SSD-7401	Permitted the following facilities at the site: • Construction and operation of a resource recovery facility to process up to 160,000 tonnes per annum (tpa) of waste, comprising: • Hydro-excavation, drill muds and fluids. • Food and garden organics. • Packaged and bulk food and liquids. • Operation of a landscaping material supplies facility for the storage and sale of up to 40,000 tpa of landscaping supplies.
SSD-7401-MOD-1	Allowed for: • An increase of processing capacity to 350,000 tpa. • Introduction of additional waste streams, including construction and demolition wastes. • Demolition of existing site structures and construction of a partially enclosed shed to house the bulk landscape material storage bays and the drill muds processing facility. • Increased operational hours.
SSD-7401-MOD-2	Permitted an alteration to the stormwater management system proposed in SSD-7401-MOD-1 to comprise an inground pit, sand filter and precast stormwater treatment device.

SSD Application / Modification	Key Works
SSD-7401-MOD-3	Approved: • Amendment to the number of previously approved weighbridges (to one centrally located weighbridge). • Re-configuration of onsite parking. • Relocation and clarification of the proposed stormwater treatment device (humeceptor as SPEL Ecoceptor 6000 series) • Relocation of the 5 kilolitre (kL) rainwater tank to inside the drill mud processing shed.

Additional details on the project approvals and modifications are provided in **Section 1.1.1** and **Section 1.1.2** of the OEMP. The OEMP covers facility operations being conducted under Stage 1 of SSD-7401, which includes the drill mud processing facility area only. Stage 2 will include operation of the bulk landscape area and organics processing areas.

For the purpose of this WMP and the overarching OEMP, only Stage 1 operations are considered. Revision/addendum to both documents will be required prior to Stage 2 operation proceeding.

1.3 WMP Scope and Objectives

The objective of this WMP is to document management controls, procedures and surface water and groundwater monitoring plans in relation to the Stage 1 operations of the site in line with the requirements outlined in the conditions of approval (COA) C7 and B49 provided in the SSD-7401 Development Consent.

1.4 Performance Objectives

The WMP must be prepared prior to commencement of site operations. In addition to meeting the COA, site operations are also regulated under the *Protection of the Environment Operations Act 1997* (POEO Act) by Environmental Protection Licence (EPL) number 21092 (10 January 2019). The EPL regulates three scheduled activities including resource recovery of general waste, waste processing (non-thermal treatment) and waste storage of other types of waste.

The conditions of the relevant SSD approval and EPL, as well as requirements of Fairfield City Council (FCC) guidelines, along with where they are addressed in this WMP, are provided in **Table 1.2** below.

Table 1.2 Approval and Licence Conditions and FCC Policy Requirements

Approval / Licence	Conditions	Section Addressed in WMP
SSD-7401 Development Consent	• Condition B49 states that: • "Prior to the commencement of operation, the Applicant must prepare a WMP to the satisfaction of the Secretary. The WMP must form part of the OEMP required by Condition C4 and be prepared in accordance with Condition C7. The WMP must: (a) be prepared by a suitably qualified and experienced person(s);	• Document Information
	(b) detail water use, disposal and management on-site	• Section 2.4.4

Approval / Licence	Conditions	Section Addressed in WMP
	(c) detail the water licence requirements for the development i.e. trade waste	• Section 2.4.4 • Trade waste agreement (TWA) not yet established with Sydney Water.
	(d) detail how leachate, stormwater and wastewater would be managed, including how any changes approved by modification applications have been addressed	• Section 4.2
	(e) detail any trigger levels to ensure overflow of wastewater and leachate at the site does not occur	• Section 4.2.2
	(f) contain a Surface Water Management Plan, including; • a program to monitor: • surface water flows and quality; • surface water storage and use; and • sediment and erosion controls; • surface water impact assessment criteria, including trigger levels for investigating and potential adverse surface water impacts; and • a protocol for the investigation and mitigation of identified exceedances of the surface water impact assessment criteria.	• Section 4.0
	(g) contain a Groundwater Management Plan, including: • baseline data on groundwater levels and quality; • a program to monitor groundwater levels and quality; • groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts; and • a protocol for the investigation and mitigation of identified exceedances of the groundwater impact assessment criteria.”	• Section 5.0
EPL 21092 (10 January 2019)	• Condition L1 addresses pollution of waters, this ensures that except where outlined in other conditions of the licence, the licensee must comply with section 120 of the POEO Act.	• Section 4.3.5 and Section 5.4
	• Condition L2 states that no waste is permitted to be accepted at the premises until stages of scheduled development work are completed to enable scheduled activities to be carried out at the premises and the EPL is varied.	• Section 3.7
	• Condition M1.2 explains monitoring record keeping requirements where monitoring data must be retained in a legible form for at least 4 years after the event takes place.	• Section 3.3. • While the EPL requires some control and monitoring of noise and odour at the premises, it does not stipulate any environmental monitoring requirements for surface water, groundwater, incoming wastes, final products, or waste by-products such as leachate.
	• Condition M1.3 outlines the sample information records required to be retained.	• Section 3.3.

Approval / Licence	Conditions	Section Addressed in WMP
	• Condition M2 outlines the requirements for the recording of pollution complaints.	• Section 3.6
	• Condition R2 outlines the requirements for notifying the NSW Environment Protection Authority (EPA) of potential incidents of environmental harm.	• Section 3.6
FCC (2017) *Stormwater Management Policy*	• Chapter 4 On Site Detention Systems: On site detention is not required within the Wetherill Park Industrial Area, which incorporates the site.	Section 5.3.5 of the FCC (2013) *Development Control Plan* (DCP) states that onsite detention of stormwater is required in an industrial setting to mitigate flow into the existing stormwater system. However, this is not required at the site in accordance with the FCC (2017).
	• Chapter 5 Water Conservation: Ensure that 80% of the roof area of the development is to drain to tanks that have a capacity of 3,000 litres (L) per 100 square metres (m^2) of roof area of the development. The tanks are to be connected to all non-potable uses including flushing toilets, irrigation, wash down and laundry.	Section 2.4.2
	• Chapter 6 Water Quality Improvements: The following stormwater pollutant reduction targets must be met by developments within the Wetherill Park Industrial Area: • Gross Pollutants: 90% • Total Suspended Solids (TSS): 80% • Total Phosphorus (TP): 55% • Total Nitrogen (TN): 40%	Section **Error! Reference source not found.**

1.5 WMP Structure

The WMP comprises the following key components:

(a) Background site information (**Section 2.0**)

(b) General environmental management (**Section 3.0**)

(c) Surface Water Management Plan (**Section 4.0**)

(d) Groundwater Management Plan (**Section 5.0**)

1.6 Relevant Legislation, Policy and Guidelines

Relevant legislation, subordinate regulation and guidelines considered applicable to the WMP at the site include, but are not necessarily limited to, the following:

- *Protection of the Environment Operations Act 1997* (POEO Act) and subordinate regulations:
  - Protection of the Environment Operations (General) Regulation 2009.
  - Protection of the Environment Operations (Waste) Regulation 2014.
- *Environmental Planning and Assessment Act 1979* (principally, development consent conditions).
- *Contaminated Land Management Act 1997.*
- *National Environmental Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council 1999 (as amended May 2013) (NEPC, 2013).
- Occupational health and safety regulations applicable to NSW workplaces.

1.7 Management Structure

The WMP has been prepared with reference to the following SSD documents:

- SSD-7401-COA.
- SSD-7401-MOD-1 Instrument of Modification.
- SSD-7401 Environmental Impact Statement (EIS), including appendices and the EIS Statement of Commitments.
- SSD-7401-MOD-1 Statement of Environmental Effects (SEE), including appendices.
- SSD-7401-MOD-2.
- SSD-7401-MOD-3.

This WMP documents environmental management controls, procedures and monitoring in relation to any wastewater, surface water and groundwater generated or received at the site. The WMP is intended to be implemented in parallel with other plans that document environmental management of other aspects of site activities, including:

- OEMP.
- Waste Management Plan.
- Trade Waste Agreement (TWA).
- Operational Traffic Management Plan.
- Pollution Incident Response Management Plan.

1.8 WMP Exclusions

Any future stages have not yet been considered in this WMP and the WMP should be updated accordingly when these stages are to be commenced.

2.0 Overview of Site

2.1 Site Identification

Table 2.1 below provides relevant site information.

Table 2.1 Site Identification

Item	Relevant Site Information
Site Address	24 Davis Road, Wetherill Park, NSW 2164
Title and Lot/Plan Identifiers	Lot 18 on Deposited Plan (DP) 249417
Site Area	Approximately 20,292 m^2
Current Site Owner	Davis Road Property Development Pty Ltd
Development Applicant	Bettergrow
Site Operator	reDirect
Local Government Area	Fairfield City Council
Current Land Use Zoning	General Industrial (IN1)

2.2 Site Development History

According to Douglas Partners (DP, 2015) *Review of Contamination Reports* and DP (2016) *Report on Groundwater Assessment*, the site was vacant and potentially used for rural purposes including grazing until approximately 1966. The site was possibly used for industrial purposes until 1978, when it was subsequently developed as an asphalt batching plant, which was operational until 2004. Since 2004, the site has been vacant/unused, although soil remediation was undertaken as part of site demolition works in 2012. Following completion of soil remediation, the environmental consultant (URS) considered that the environmental conditions at the site were suitable for commercial/industrial use.

At the time of commencing construction of the resource recovery facility, the site consisted of the following structures and infrastructure:

- A workshop, laboratory, storerooms, staff amenities building, and electrical substation located towards the eastern boundary of the site.
- An office building adjacent to the southern boundary.
- Concrete raw material bays on the middle and on the eastern boundaries of the site.
- In-ground recycled water tanks in the south of site.
- A remnant shelter on the higher level on the eastern boundary of the site.
- Retaining walls between higher, mid and lower levels of the site.
- An oil separator pit on the middle level on the eastern boundary of the site.

- The existing stormwater management system.

The site was majority sealed with asphalt or concrete hardstand except for gravels in the upper and lower levels where remediation works have historically occurred.

2.3 Received Waste Types

The approved waste streams to be received at the site, as part of Stage 1 and Stage 2, are the following:

- 100,000 tpa of drilling mud and/or muddy water from hydro-excavation, drilling and pot holing operations.
- 70,000 tpa of food and garden organics (FGO).
- 30,000 tpa of packaged and bulk food solid and liquid waste.
- 150,000 tpa of general solid waste, including:
- Excavated natural material (ENM).
- Virgin excavated natural material (VENM).
- Soils.
- Gravels
- Aggregates.
- Sawdust.
- Spent filter sand media.
- Street sweepings.
- Stormwater waste.
- Clean timber.
- Asphalt waste.
- Cured concrete.
- Rail ballast.
- Construction and demolition waste.

2.4 Site Operations

2.4.1 Site Processes

The site is split into three main levels, the upper level, mid-level and lower level. At this point in time, the upper level is reserved for future uses that will include the FGO processing facility and the food and liquid depackaging (FLD) facility.

The mid and lower levels of the facility are constructed for the bulk landscape supplies (in the future) and drill mud processing facility. The key waste processing will occur within a semi-enclosed shed.

Hydro-excavation and drill muds are produced from general borehole drilling, directional drilling, geotechnical investigations and exploratory drilling. The muds produced as a by-product are predominantly made up of a mixture of soil, rock, water and drilling fluids.

Both wet and dry waste streams can be processed through the system, which will remove and segregate oversized waste, residual waste, organics and metals. Remaining gravels will be scrubbed, washed, and separated based on particle size. The wash liquid will be processed further to remove any remaining fine materials and sediments and then it will be re-used on site for various functions.

Details of the treatment process are provided by RPS (RPS, 2020) *Statement of Environmental Effects*. A summary of the drill muds process is provided in **Table 2.2** below.

Table 2.2: Treatment Process Summary

Step	Description
1	Loads are inspected to ensure waste is suitable for processing.
2	Waste enters one of four hydro-tips where it is dewatered and graded. • Large solids (i.e. rock, concrete etc) are sent to a scalping screen for further separation. • Smaller solids, including aggregates and sand, are sent to the trommel for scrubbing and removal of potential contaminants. • Liquids and sub 5 millimetre (mm) materials are pumped to a dual stage washing and recycling system where they are dewatered. Coarse sediments and grit are removed at this stage. • All remaining liquids and fine materials that are not captured are pumped to a buffer tank.
3	The liquids in the buffer tank are treated with a polymer, coagulants, then processed through a clarifier and a centrifuge. Clean water is then pumped to a storage tank (process water storage tank) for reuse within the system. Excess is discharged to sewer under a TWA with Sydney Water.
4	Finished products from the system include aggregates of varying sizes, dewatered fine cakes, residual waste, organic material, ferrous metals and wastewater.

A process flow diagram is provided in **Appendix A**.

2.4.2 Water Inputs

For the purposes of this WMP, water inputs include drill mud process water, stormwater and toilet water. Standard potable water consumption (including drinking water and showers) is not considered relevant to this document due to the small volumes and routine use.

Water balance modelling has been completed and reported in Eclipse (2021) *Stormwater Management Plan* and Northrop (2015) *Surface Water Assessment*. Relevant Stage 1 water use data, presented below, is taken from the modelling presented in these reports.

Water processes and associated inputs considered relevant to the WMP include the following:

Rainfall Inputs

Rainfall data was collected from the Prospect Reservoir weather station (no. 67019). Dry, median and wet years from the Prospect Reservoir are provided in the surface water assessment by Northrop (2015) and are listed as:

- 10th Percentile (dry year): 572 mm.
- 50th Percentile (median year): 862 mm.
- 90th Percentile (wet year): 1,178 mm.

A portion of the drill mud processing shed roof rainfall runoff is to be collected in a 5 kL tank, which has been sized to meet the site's reuse demand for non-potable water; the remainder of roof water collected, as well as surface water runoff from the hardstand and roof areas not connected to the rainwater tank, will be directed into the stormwater system for processing prior to release to council stormwater system. Rainwater re-use is anticipated to be used for internal non-potable uses, most notably flushing of toilets.

Potable Water Inputs

The site is connected to a 200 mm diameter Sydney Water potable water main. Northrop (2015) assumed that when the rainwater tank falls below 10% capacity, then it will be topped up with potable water until it reaches 40% capacity. Potable water will also be utilised for mixing of polymers within the drill mud processing facility - Northrop (2015) specified that the average daily usage of potable water for polymer mixing will be 12 kL/day.

Drill Mud Processing Facility Inputs

Water also enters the system via the drill muds that are imported to site for processing. In surface water modelling, Northrop (2015) assumed that incoming drill muds will contain 60% water.

2.4.3 Storage

Proposed water storage for the site is summarised in **Table** 2.3.

Table 2.3 **Proposed Water Storage On-Site.**

Water Systems	Water Storage
1 – Proposed Office Building	
2 – Existing Amenities Building	• No water storage, all water to go directly to stormwater via surface water treatment system.
3 – Existing Site Office Building	
4 – Drill Mud Processing Facility	• Process water storage tank • Treated water storage tanks (2 x 35 kL) • Rainwater tank (1 x 5 kL)
5 – Stormwater System	• Sand filter detention pit and SPEL Ecoceptor pollutant trap (prior to discharge)

2.4.4 Water Losses and Usage

The anticipated water usages and losses provided by Eclipse (2021) are summarised in Error! Reference source not found. below:

Table 2.4 Site Water Uses and Outputs

Water Systems	Water Usage and Losses
1 – Proposed Office Building	
2 – Existing Amenities Building	• Toilets x 4 (0.4 kL/day total) utilising rainwater. • Rainwater from the existing office will be captured by the stormwater system.
3 – Existing Site Office Building	

Water Systems	Water Usage and Losses

4 – Drill Mud Processing Facility	• Overflows from the rainwater tank will be diverted to the stormwater system.
	• All treated water is to be discharged to sewer under a TWA. Where the water quality is in exceedance of the TWA (refer to discussion below on testing and holding facilities), it will be transported offsite via truck to a licenced liquid waste facility.
	• Residual water within the outgoing solid products is assumed to be:
	  • Grit, sand and organics will have an approximate moisture content of 10%.
	  • Mud will have an approximate moisture content of 30%.

5 – Stormwater System	• The stormwater treatment system comprises sand filter detention pit and a precast concrete stormwater treatment device (an Ecoceptor). Details of the stormwater system are provided in **Table** 2.5.

Wastewater Discharge

The drill mud processing facility is designed to optimise water recovery from the drill muds and significantly reduce the water content in the outgoing recycled products. There is, however, an expectation that wastewater will need to be discharged to sewer under a TWA. The sewer connection will be a 225 mm diameter gravity main located on the northern side of Davis Road which will connect to the 300 mm diameter trunk sewer main.

All extracted wastewater from the drill mud processing facility will be piped to three tanks for re-use and eventual discharge to sewer subject to conditions presented in a Sydney Water TWA. Tanks will be bunded in accordance with the *Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin* (EPA,1997). At the time of writing this WMP, a TWA is still in negotiation with Sydney Water.

Prior to release, the wastewater will undergo treatment through flocculation and centrifuge to remove suspended solids and the mud fractions, and, therefore, removing contaminants potentially bound in the soils.

The site operator will be required to negotiate a TWA with Sydney Water to determine the acceptance standards and ensure compliance. Wastewater will be sampled and analysed prior to a metered release to ensure compliance with the TWA.

Northrop (2015) estimated that water extracted from the drill mud processing plant coupled with rainfall collected within the bunded area and potable water inputs for the polymer mixing will result, on average, with 103.4 kL/day requiring release to sewer under the TWA. This rate is assuming 164 tonnes of drill muds and fluids are received daily at the site.

If the water in the clean water storage tanks (see **Appendix A**) meets the TWA conditions, then it will be discharged to sewer. If the water is not suitable for discharge, the water will be trucked from site to an appropriately licensed waste facility.

Testing and Holding

Process waters and subsequently wastewaters will be held in a process water tank and two clean water storage tanks following treatment in the centrifuge (refer to **Appendix A**). Waters held in these tanks will be reused in the drill muds processing until there is an oversupply in water. At this point waters will be tested and when capacity is at 80%.

2.4.5 Site Structures

A summary of all major site infrastructure to be construction for Stage 1 of operations is provided in **Table** 2.5. The site plan provided in **Appendix B** displays the locations of these structures.

Table 2.5 **Site Structures and Infrastructure**

Structure	Description
Office and Amenities (lower level)	An office, meeting room and bathroom amenities are located in the main administration building at the entrance to the site (east of the main driveway).
Access (lower level)	All vehicles enter via a combined ingress/egress access driveway, providing a 12.5 metre (m) width at the western property boundary and facilitating connectivity between the off-street parking and internal heavy vehicle circulation areas. An additional ingress/egress driveway, with a width of 5.5 m has also been installed adjacent to the eastern property boundary. This will be restricted to use by staff accessing the offices and will remain clear for emergency use.
Weighbridge (lower level)	One weighbridge will initially be installed along the western access road. In the long-term, additional weighbridges may be constructed as site capacity increases.
Car parking (lower level)	Paved parking spaces, installed in accordance with relevant Australian Standards, will be provided.
Processing plant and equipment (lower/mid-levels)	A partially enclosed shed is to be constructed over the drill mud processing plant and equipment, including the truck unloading area. The total area of the shed is to be 7,970 m^2. The drill mud processing plant and equipment will consist of 4 x hydro-tips and 1 x tip-pit. Bulk landscape material storage bays inside the shed.
Rainwater harvesting system (lower/mid-levels)	The roof of the semi-enclosed process shed is to be outfitted with downpipes to direct roof water runoff into above-ground rainwater harvesting tanks for reuse on site. As per SSD-7401-MOD-3, the rainwater tank will be located inside the drill mud facility shed in close proximity to the control room on the middle level of site.
Stormwater system (lower/mid-levels)	The stormwater system is comprised of four stages: • Rainwater tank: 5 kL rainwater tank • Gravity driven stormwater pipe network • Sand filter detention pit: The sand filter provides media-based filtration. The media within the detention pit consists of highly permeable sand which effectively removes suspended solids and nutrients. The basin has been designed to allow for 600 mm of extended detention, at which point water will overflow an internal weir and will be directed to the outlet sump. Design specifications are provided in the stormwater management plan (Eclipse, 2021). • SPEL Ecoceptor 6000 Series: SPEL Ecoceptor is a vertically configured pollutant trap, sediment and light non-aqueous phase liquid (LNAPL) separator suitable for low-risk applications. The Ecoceptor separates sediment, silt, total suspended solids, oil and grease, litter and hydrocarbon spills. The Ecoceptor will be installed as an underground fibreglass tank that can store up to 11,500 L of pollutants. Details are provided in SSD-7401-MOD-3.

2.5 Environmental Setting

The site's natural setting has been summarised by Senversa, based on review of existing reports, below:

2.5.1 Climate

Rainfall at this site has been recorded by a nearby Bureau of Meteorology (BoM) station (No. 067019) located at Prospect Reservoir since 1887. The mean annual rainfall recorded for the area is 876.8 mm.

2.5.2 Topography

The ground elevation of the site ranges from 36 to 48 metres Australian Height Datum (m AHD), with an overall downhill slope towards Davis Road in the south (lower level). The highest point is located at the northern extent of the site (URS, 2013) (upper level).

2.5.3 Geology and Soils

According to the Groundwater Assessment Report (DP, 2016) the site and surrounding area is generally underlain by Bringelly Shale of the Wianamatta Group. The Bringelly Shale is made up of Middle Triassic shale, carbonaceous claystones, laminate, fine to medium grained lithic sandstone.

The Wianamatta group typically consists of three formations: Bringelly Shale (top), Minchinbury Sandstone (middle) and Ashfield Shale (bottom). The group typically exists with a maximum thickness of 300 m. The Wianamatta formation is underlain by the Mittagong Formation and Hawkesbury Sandstone.

Soils underlying the site are predominantly composed of the Blacktown soil landscape which is made up of shallow to moderately deep hard setting, mottled textured clay soils. However, the site is highly disturbed and has predominantly been cut from the shale slope with some areas utilising fill for the levelling of site.

The DP (2015) *Review of Contamination Reports* summarised the findings of multiple URS assessments and concluded that site lithology comprises:

- Sand and gravel fill with various compositions of clay sand to a maximum depth of 2.4 metres below ground level (m bgl).
- Natural brown to white clay or clayey sands to depths ranging between 0.5 m and 3.0 m bgl.
- Shale and siltstone from approximately 3.0 m bgl.

Acid sulfate soils have not been identified at the site and according to FCC Local Environment Plan (LEP) is a low risk.

2.5.4 Hydrology

Regional

The site and its surrounds are located within the Georges River catchment which covers an area of approximately 960 kilometres squared (km^2) and discharges into Botany Bay.

Site Drainage

A small portion of the site's stormwater likely infiltrates to the subsurface in pervious areas (garden beds, Cumberland Plain woodland areas of site (near Davis Road) and unsealed gravel access road running up the eastern boundary), with the remaining portion subject to runoff (noting that evapotranspiration and minor seepage through cracks will also occur).

Surface water runoff at the site following completion of the development will likely occurs as:

- Flow from a portion of the shed roof is to be directed into a 5 kL rain harvesting tank when capacity is available and into the site's stormwater system when the capacity of the rain harvesting tank is reached.
- Flow from hardstand areas and areas of the roof not connected to the rainwater harvesting tank will be conveyed via a gravity driven pipe network towards the south of the site. Stormwater will then be then discharged into a sand filter bed (formed from the structure of a weighbridge pit used on the site by the previous occupants) before being discharged to a SPEL Ecoceptor 6000 series stormwater quality improvement device, then discharged offsite.
- Runoff for a small portion of the site near the southern boundary could potentially run directly offsite into Davis Road stormwater drains.

Stormwater discharges from site near the south-eastern corner, then proceeds east where it discharges into a concrete channel flowing towards the north-east adjacent to the Wetherill Park industrial estate. This concrete channel is the primary stormwater collector for the entire estate. The channel discharges into Prospect Creek near Widemere Road 1 km east of the site.

2.5.5 Hydrogeology

Occurrence and Flow

Groundwater is present in the shale bedrock and has historically been observed at between 0.15 to 3.07 metres below top of casing (m btoc) (URS, 2013 as summarised in DP, 2016).

Aquifer properties have not been assessed at the site. However, based on the presence of shale and clay in the shallow stratigraphy, literature suggesting low hydraulic conductivity and low well yield (DP, 2016), water observations during drilling of historical groundwater monitoring wells indicating that the substrate appeared to be predominantly dry during drilling (DP, 2016) and groundwater sampling sheets indicating that the wells were bailed dry during development (DP, 2016), the aquifer is likely to be of relatively low permeability, with most flow inferred to occur within fractures and bedding planes of underlying shale bedrock. Further to this, Bringelly Shale is considered an aquitard which would suggest that groundwater on site is relatively immobile.

Quality

Shallow groundwater quality measurements have been collected for the site and indicated:

- Dissolved oxygen (DO) varied from 0.4 parts per million (ppm) to 7.37 ppm which indicates poor to well oxygenated water.
- Redox potential measurements ranged from 172 millivolts (mV) to 2.37 mV indicating moderately oxidising conditions.
- Electrical conductivity (EC) ranged from 700 to 21,344 milligrams per litre (mg/L) total dissolved solids (TDS) indicating fresh to brackish/saline waters.

Section 8.2 of the groundwater assessment (DP 2016) indicated that the development poses a low risk of significantly impacting groundwater quality.

Further description of the groundwater quality at the site, including the nature of chemicals of concern, is presented in the groundwater monitoring plan (**Section 5.3**).

Groundwater Dependent Ecosystems and Beneficial Use

The groundwater dependent ecosystems Atlas indicates:

- There are no aquatic or subterranean groundwater dependent ecosystems (GDE) within 1 km of the site.
- There are potential terrestrial GDE present approximately 300 m north of the site boundary – in particular, moderate potential GDE (Cumberland Shale Plains Woodland) and high potential GDE (Cumberland River Flat Forest - River-Flat Eucalypt Forest on Coastal Floodplains). These potential GDE generally coincide with Prospect Creek and its associated drainage lines and tributaries.

These GDE are located upgradient of the site and site activities are not anticipated to impact on the GDE.

A search by Senversa of groundwater monitoring wells registered with the Water NSW on 13 January 2022 indicated that 17 groundwater bores were located within 500 m of the site.

Regionally, Bringelly Shale is unsuitable for beneficial groundwater uses due to high salinity and poor recharge. Senversa has noted that groundwater abstraction is not planned for the site, does not typically occur in the area and no known groundwater extraction bores are near the site.

2.6 Surrounding Land Use and Receptors

The site is situated within the Wetherill Park Industrial Estate which is zoned for general industrial land uses. Therefore, the site is predominantly surrounded by commercial and industrial businesses and no residential receptors were identified.

The surrounding commercial and industrial businesses and land uses include the following:

- North: Immediately north of the site is a Sydney Water supply pipe and easement, beyond this is bushland, Prospect Creek and beyond that Prospect Reservoir.
- South: Industrial/commercial businesses including a resource recovery facility operated by SUEZ Pty Ltd to the south-west and a recycling facility operated by Cleanaway Pty Ltd to the south-east.
- East: Industrial/commercial businesses including a petroleum product and fuel production facility operated by Valvoline Pty Ltd.
- West: Industrial/commercial businesses including metal recycling facility operated by One Steel Limited. Furthest west at 22 Davis Road is a manufacturing facility for surfactants, phosphates and chemicals.

Based on this, a summary of the possible receptors of potentially impacted water derived from the site includes the following:

- Off-site recreational users of Prospect Creek – Although the site is down gradient of Prospect Creek, the stormwater channel running through Wetherill Park Industrial Estate drains into Prospect Creek. The risk of site activities impacting Prospect Creek does however remain low.
- On-site workers have the potential to come into direct contact with stormwater or groundwater – however, site workers are subject to occupational health and safety controls and procedures to manage these and are not considered receptors for the purposes of this WMP.

3.0 Environmental Management

3.1 Roles and Responsibilities

All staff and contactors have an obligation to ensure the appropriate implementation of the WMP. Roles and responsibilities should be reviewed and refined if required and appropriately qualified staff should undertake any work or inspections associated with this WMP. **Table 3.1** below outlines the primary roles and responsibilities on the site.

Table 3.1 Roles and Responsibilities

Entity / Role	Responsibility
Project Manager	• Ensure that all works carried out on site comply with relevant regulatory and project requirements. • Ensure that the requirements of the OEMP and WMP are fully implemented and effective.
Operations Manager	• Ensure that any contractors or employees undertaking activities under the WMP are provided with a copy of this WMP and comply with its requirements. • Notify each relevant authority of any pollution incident that causes or threatens material harm to the environment (in accordance with POEO Act). • Record and report any incidents and complaints.
Environmental Manager	• Assist in ensuring the implementation of the WMP and ensure it remains relevant and up to date. • Comply with the requirements of WMP. • Maintain site records related to the implementation of the WMP. • Undertake site inspections, and complete reporting
All project personnel including contractors	• Comply with the requirements of this WMP. • Undertake any relevant environmental training required. • Reporting any observed environmental incidents including spills or discharges.
Environmental Consultant (where required)	• Carry out groundwater sampling as outlined in Section 5.3.
Suitably qualified/ experienced person	• Prepare WMP and review/update WMP, inclusive of the surface water management plan and groundwater management plan, as required. • Undertake monitoring and inspections specified within the WMP.

3.2 Training

reDirect shall ensure that any personnel engaged in the implementation of nominated tasks for which reDirect is responsible within the WMP have been provided with adequate training and are capable of performing the work to an adequate standard.

3.3 Reporting, Review and Auditing

Reporting and notifications shall be in accordance with the OEMP.

As described in section 7.9 of the OEMP, review and auditing of the OEMP, WMP and works conducted under the WMP shall be undertaken by Independent Environmental Auditors within one year of the commencement of operations and at least every three years thereafter or upon significant change to process or waste management practices.

Although not specifically stated for stormwater or groundwater, the EPL states that monitoring data, including the below details, must be retained in a legible form for at least four years after the event takes place. This requirement will also be adopted for stormwater and groundwater data:

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

3.4 Performance Indicators

The Facility Operations Manager / Environmental Representative will undertake quarterly audits of the Facility, assessing compliance against:

- WMP Objectives (refer **Section 1.3**) and Targets (refer **Section** Error! Reference source not found.).
- Pollution incidents and status of incident closure (refer to **Section 3.5**).
- Progress implementing the WMP.
- Status of corrective actions closure (refer to Section 6.2.5 of the OEMP).

3.5 Emergency Contacts and Response

Pollution Incidents shall be managed in accordance with:

- reDirect Recycling (2021). *Pollution Incident Response Management Plan, reDirect Recycling, 24 Davis Road, Wetherill Park NSW*. 13 November 2021.

3.6 Community Complaints, Non-compliances and Exceedances.

Community complaints, non-compliances and exceedances will be handled in line with the processes outlined in Section 8.3 of the OEMP.

Non-compliances and exceedances will be reported in line with the EPL and any exceedances will be included in the annual return and annual environmental management review.

3.7 Review and Revision of the WMP

This WMP is a working document, it is expected that it will require review, revision and/or amendment to accommodate any relevant development consent, EPL or legislation changes and to continually improve the effectiveness of the current and future WMPs.

reDirect as the owner of this document is responsible for the review and revision of this WMP document. The review and any updates of this WMP should be conducted by a suitably qualified and experienced person, and tracked via a version control record (e.g. in the Document Control Table on page ii).

The review process may consider:

- Changes to the approved COA.
- Changes to EPL control and monitoring requirements.
- Changes in legislation or regulatory requirements.
- Inputs or responses from regulatory agencies.
- Monitoring outcomes.
- Incident investigations and non-conformances.
- Audit and inspection findings.
- Changes in organisational structure and/or responsibilities.
- Changes in voluntary obligations and compliance obligations.

4.0 Surface Water Management Plan

4.1 Surface Water Description

For the purposes of this WMP, surface water is considered any surface water other than process water, leachate or wastewater, which will be managed in accordance with **Section 4.2.3,** being defined as:

- Process water is water used in the processing of drill muds.
- Leachate is water generated typically through the action of rain coming into contact with soil stockpiles. Leachate is not anticipated to be generated onsite during Stage 1 of operations due to bulk storage bays being underneath the main processing shed.
- Wastewater is water generated through the processing of drill muds that require disposal or have no further use on site.

Surface water is, thus, principally stormwater runoff from building roofs and areas outside waste processing or handling areas.

4.1.1 Surface Water System

The key features of surface water (and process and wastewater) management at the site are described in **Section 2.4**. A description of regional hydrology and site surface runoff drainage was described in **Section 2.5.4**. A description of receiving water bodies and sensitive receptors was provided in **Section 2.6**.

Indicative site surface water runoff flow directions and catchments are presented in **Appendix D** - these have been adapted from the stormwater management plan (Eclipse, 2021) and based on observations during a site visit.

Surface water discharges from operational areas of the site and areas with potential to discharge off-site are summarised in the following table. Surface water may also discharge from other areas of the site, but these areas are away from operational areas and are not considered further in this WMP.

Table 4.1 Surface Water Sources and Management

Site Feature	Purpose	Runoff Water Sources	Management
Entrance Driveway	Site access	The driveway receives runoff from paved areas near the weighbridge and entrance areas.	Management under this surface water management plan – though this is considered a low risk of impact.
Drill Mud Processing Shed	Rainwater re-use	A portion of roof water runoff from the drill mud processing shed is to be directed by downpipes to an above-ground rainwater harvesting tank which has been sized to meet the facility's reuse demand for non-potable water of 5 kL. The harvested volume from the shed roof is to be internally reused through the amenities connections with tank overflows being diverted directly to the stormwater system. The remainder of the roof water collected is to be directed to the stormwater system.	Ensure downpipe leaf eaters, first flush devices and litter screens are unblocked and are operating correctly. Regularly check the structural integrity of the tanks. Check for any accumulated litter, sediment, or debris on or within the tanks.

Site Feature	Purpose	Runoff Water Sources	Management
Stormwater System	Collection, treatment and transportation of stormwater from the site.	Runoff from majority of sealed surfaces on the site, all roof areas not connected to the rainwater tank system and rainwater tank overflow will be diverted into the stormwater system.	Management under the stormwater management plan (Eclipse 2021) and this WMP. Remove deposited sediment and debris from the sand filter bed/detention pit and Ecoceptor inlet/outlet areas. Regularly check the structural integrity of hydraulic structures.

4.2 Surface Water Management Controls

The goal of surface water management controls is to mitigate the risk to the receiving environment from site activities – this includes protection of receiving surface water environments and groundwater.

The principal controls include:

- Maximise segregation of 'clean' surface water from process or wastewater.
- Mitigate off-site migration of sediments and suspended solids in stormwater runoff.
- Manage and monitor discharges from the site.
- Appropriate storage of materials and liquids.

Surface water controls proposed to minimise any mixing of surface waters with wastewaters, soils or drill muds include:

- Stormwater runoff from some roof tops will be captured and diverted to a 5 kL rainwater tank for re-use on site.
- All drill mud processing is taking place inside of the shed preventing surface waters from coming into contact with muds.
- Stormwater runoff from the hardstand areas, rooftops and parking areas will flow into stormwater drains, through the sand filter bed and into an Ecoceptor prior to being discharged.
- No waste soils or products will be stored in areas where rainwater can come into contact and generate leachate.

Infrastructure used to capture roof runoff does not always capture all the runoff during wet periods. In the event of rainwater tank overflow, water will be conveyed into the stormwater system, through the sand filter bed and into the approved Ecoceptor system prior to being discharged into the existing Council stormwater system along Davis Road.

Similarly, runoff from the eastern road, the western and southwestern hardstand areas will be conveyed through the stormwater system and into the sand filter bed and then through the Ecoceptor.

4.2.1 Stormwater Management Changes in Modification Applications

Condition B49(d) of SSD-7401-MOD-3 requires the WMP to "*detail how leachate, stormwater and wastewater would be managed, including how any changes approved by modification applications have been addressed*". This WMP (Rev1) has been prepared with consideration of the changes to surface water management included in modification applications to date and is current for SSD-7401-MOD-3. As such, no revision of this WMP (Rev1) is required for compliance with SSD-7401-MOD-3, while previous designs under SSD-7401, SSD-7401-MOD-1 and SSD-7401-MOD-2 had been superseded at the time of WMP preparation. Approval of future modification applications may require this WMP to be updated depending on the nature of the modification (see Section 4.55 of the NSW *Environmental Planning and Assessment Act 1979*). Any

updates of this WMP will be tracked via the version control recorded in the Document Control Table on page ii.

The following subsections of this WMP (Rev1) address Condition B49(d) with regards to surface water management for the facility design approved under SSD-7401-MOD-3.

SSD-7401-MOD-1 required an update of surface water management to account for the construction of the enclosed roof space and manage the increase in processing quantities for the facility. This included the installation of two rainwater tanks to capture water reuse and recycling, with the stormwater network to be conveyed southwest towards a 30 kL sediment basin for settling, with overflow conveyed to a 50 m^2 bioretention basin for onsite treatment. Discharge from the bioretention basin, gravel areas and rainwater tank overflow was then directed to a proprietary humeceptor system for hydrodynamic and gravitational separation to remove TSS and entrained hydrocarbons. Treated water would then be discharged into the Fairfield City Council stormwater system along Davis Rd.

SSD-7401-MOD-2 related to the replacement of the approved 30 kL sediment basin and associated bioretention basin. SSD-7401-MOD-2 included the provision of an inground sand filter (still current in SSD-7401-MOD-3) to provide primary surface water treatment in lieu of the detention and bioretention basins.

The sand filter provides media-based filtration unit. The media consists of highly permeable sand which effectively removes suspended solids and nutrients. The basin has been designed to allow for 600 mm of extended detention, at which point overflows are directed to the outlet sump. Overflows were then to be directed to a humeceptor system for final treatment prior to release into Fairfield City Council stormwater system along Davis Rd, the same as SSD-7401-MOD-1 (albeit small changes in underground pipe alignment were proposed).

SSD-7401-MOD-3 included two changes to the SSD-7401-MOD-2 surface water treatment design, including:

1. Relocation of proposed humeceptor water treatment device to the north-western corner of the central portion of Cumberland Plain Woodland onsite.
2. Relocation of the 5 kL rainwater tank to inside the drill muds processing shed next to the control room. Rainwater from the existing office will now be captured via the Facility stormwater network.

The final water treatment device, labelled as a humeceptor in previous applications, was clarified to be a SPEL Ecoceptor 6000 series in SSD-7401-MOD-3. The SPEL Ecoceptor 6000 series measures 2720 mm diameter and 3300 mm depth and therefore was consistent with previous applications, with a storage capacity of up to 11,500 L of pollutants. All modifications regarding onsite water storage were sized to meet the Facility's reuse demand for non-potable water under the relevant Stormwater Assessment. Remaining surface water run-off from the drill muds roof space is conveyed into the stormwater network, which remained the same as SSD-7401-MOD-2 excepting the modifications described above and an updated alignment of underground pipelines to suit the new stormwater treatment layout.

4.2.2 Potential Impact from Leachate and Wastewater

At the time of writing this WMP, Senversa has been advised that all waste soil and product stockpiles will be stored inside the main shed. If any waste product is intended to be stored in an area where rainwater can infiltrate the stockpiles and generate leachate in the future, then a leachate management plan should be added to this WMP.

Process waters will be collected from the centrifuge as shown in **Appendix A** and directed to a process water storage tank and subsequently two clean water storage tanks, all of which are located within the shed. From here, the process waters will continue to be re-used in the process until there is an excess in the system at which point the process water will be released to sewer under the TWA or trucked off site if it does not meet TWA requirements.

4.2.3 Surface Water Storage, Use and Discharge Management

Surface water from the site will be managed as follows:

- Runoff is directed to the sand filter. The sand filter allows for an extended detention before overtopping an internal weir which then directs the water to an outlet sump. Refer to the Stormwater Management Plan (Eclipse, 2021) for design specifications.
- The outlet sump then runs via gravity driven pipes to a SPEL Ecoceptor 6000 series treatment device, which has been designed and sized to meet the requirements of the site. The Ecoceptor device which is a precast concrete device that uses gravitational and hydrodynamic separation to remove hydrocarbons and fine suspended solids (<10 microns).
- From the Ecoceptor, stormwater is discharged directly to the council stormwater system. The stormwater system is passive; therefore, no active discharge management will be required.

Stormwater will only be stored on site within the sand filter bed, which has been designed to allow for 600 mm of extended detention, at which point overflows are directed to the outlet sump and the Ecoceptor. The only other surface water to be retained on site will be the rainwater harvested from the drill mud processing shed roof, which will be stored in a 5 kL rainwater tank.

4.2.4 Sediment and Erosion Control

Sediment and erosion controls will be implemented to mitigate migration of sediments and fines into drains and minimise potential impact on the surrounding off-site environment. General controls include those in Landcom (2004) *Managing Urban Stormwater: Soils and construction* - Volume 1, 4th edition.

Specific controls include:

- All trafficable areas will be sealed to minimise erosion and tracking of dirt off-site.
- Minimise dust and materials within the car park area, driveway, ramp and on Davis Road and minimising tracking from the loader via mechanical cleaning of truck wheels and tailgates prior to leaving site and use of street sweeper on a regular basis.
- Clean stormwater drains and pits in the carpark area periodically (e.g. annually or as required).
- Implementing sediment and erosion controls during construction or excavation works via temporary sediment fencing.
- Sediment trap constructed in the south-eastern and south-western corners of site during construction phase only.

4.2.5 Material Storage and Handling

The goal for material storage and handling is to minimise the potential for spilling, leaking, entrainment of products to un-bunded areas and runoff into the stormwater system. This is principally achieved by location of the main waste processing area inside the drill mud processing shed. The remaining areas of concern include receiving bays, ramps and floors of the processing areas. Dispatch of products must occur in bunded areas under cover.

Controls for material storage and handling include:

- Storage of any bulk materials under cover within a bunded area to the extent practicable.
- Minimise tracking of soils from the receiving areas and processing sheds via mechanical cleaning of wheels and tailgates of trucks prior to leaving site.
- Cleaning of tracked materials in the car park area, ramp, driveway and on Davis Road using street sweeper on a regular basis and prior to rainfall events if practicable.
- Cleaning out of sediment build up in the stormwater drains, Ecoceptor and sand filter bed periodically (e.g. annually or as required).
- Minimise delivery and unloading of bulk materials in the receiving bays during windy / rainfall events.

- Undertake vehicle maintenance on a sealed surface and within a bunded area with appropriate controls in place or offsite at a vehicle maintenance yard.
- Placement of spill kits throughout the facility.

4.2.6 Dust and Odour Control

Dust and odour controls shall be implemented in accordance with the *Air Quality and Odour Management Plan* (Advanced Environmental Dynamics, 2021). This document is provided in the OEMP.

The majority of the material being recycled is wet drill muds, therefore, minimal dust will be generated during tipping activities.

4.3 Surface Water Monitoring and Inspections

4.3.1 Monitoring Objectives

The objectives of surface water monitoring are to:

- Ensure surface water/stormwater controls are adequately maintained and performing to meet the performance targets set out in the SSD COA and FCC (2017) Stormwater Management Policy.
- Assess surface water/stormwater quality with respect to Condition L1.1 of EPL 21092.

4.3.2 Monitoring Network

Due to minimal surface water being detained on site, monitoring locations consist of the following:

- General site areas outside of covered and controlled processing areas (e.g. driveway, car park area, ramp).
- Sand filter bed inflow sampling point (to assess quality of surface water across the site prior to treatment) – SW1.
- Ecoceptor outflow sampling point (to assess quality of surface water across the site following treatment and prior to discharge from site) – SW2.

Figure 2 indicates the locations of each surface water sampling point.

4.3.3 Monitoring Requirements

The monitoring program shall broadly comprise regular site inspections and checks of stormwater control systems, and periodic sampling of stormwater quality. Additional monitoring is triggered by changes in site activities, environmental incidents or unexpected finds. A surface water monitoring program is outlined in **Table** 4**.2Table** 4.2 below, with triggers and actions presented in **Section 4.3.5**.

During development of the monitoring program, water monitoring provisions in NSW DEC (2004) *Environmental Guidelines for Composting and Related Organics Processing Facilities*, were considered. However, this guidance is not relevant to Stage 1 and therefore not all provisions have been included. Per **Section 3.7**, the suitability of this WMP should be reviewed, with the WMP updated if necessary, prior to Stage 2 operations commencing.

Table 4.2 Surface Water Monitoring Programs

Event Type	Frequency	Monitoring Aspect	Locations	Inspection Sample Analytical Schedule	Reporting Schedule
Ongoing inspections	Weekly	Observation	General site areas outside of covered and controlled processing areas (e.g. driveway, car park area, ramp).	No gross pollutants observed or waste materials stored or accumulated at ground surface or in surface runoff.	Annual factual report (refer to **Section 4.3.6)**
	Quarterly (following a rainfall event)		All surface water sampling points and subsurface drain pits	Refer **Table 4-3** below. Stormwater control devices maintained and operating as designed and in this WMP. No significant sediment accumulated in drains/pits.	
Ongoing sampling	Six-monthly (following a rainfall event) for two years, then annual (subject to review of results)	Level and quality	All surface water monitoring points	First two years: pH, TDS, TSS, total nitrogen (TN), total phosphorus (TP), dissolved metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH) and phenol. Ongoing: pH, TSS, TP and TN, or subject to results of above sampling. Record level in sand filter and Ecoceptor as appropriate.	Annual factual report (refer to **Section 4.3.6)**
Triggered (e.g. environmental incident or unexpected find)*****	Event based	Observation, quality	Inspection and sampling of downstream areas as required by event	As required – default is pH, TSS, TN, TP, dissolved metals, TPH	Annual factual report (refer to **Section 4.3.6)**

* The required inspection, sampling and analytical schedule should be assessed by a suitable qualified and experienced person at the time of the trigger response.

¯Dissolved metals: Arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury

4.3.4 Sampling Methodology

Sampling shall be undertaken by a suitably qualified and experienced person consistent with guidance in:

- DEC (2004). *Approved Methods for Sampling and Analysis of Water Pollutants in NSW*. March 2004. NSW Department of Environment and Conservation.
- Australian Standard/New Zealand Standard (AS/NZS) 5667.1:1998, *Water Quality – Sampling* series.
- NEPC (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999* (amended 2013), Schedule B (2) *Guideline on Site Characterisation*.

Records of sampling time/date, sampler, and observations (colour, odour, sheen, turbidity) shall be recorded.

Appropriate data quality assurance (QA) and quality control (QC) procedures consistent with the above guidance shall be implemented and assessed as part of the program.

All analyses shall be conducted by a National Association of Testing Authorities (NATA) accredited laboratory.

4.3.5 Trigger Levels and Action Responses

If any of the stormwater pollutant reduction targets in **Table 1.2** are not met, or there are visual indications of contamination (e.g. a visible sheen on the stormwater or hydrocarbon odour), then the stormwater system should be inspected and maintenance activities undertaken to maximise the performance of the treatment train.

Monitoring and maintenance actions identified by Eclipse (2021), and supplementary tasks, are listed in **Table** 4**.3**.

Table 4**.3 Triggers and Action Responses**

Item being monitored	Monitoring Task	Purpose of Monitoring	Maintenance Action
General			
Environmental Incident or Unexpected Find	Environmental incident in driveway, ramp or car park etc. Visual indications of gross contamination at ground surface, drain or stormwater control device (e.g. a visible sheen, hydrocarbon odour or staining, gross waste).	Check whether additional environmental controls or monitoring are required. Assess notification requirements (e.g. to FCC, EPA).	Implement additional environmental controls (e.g. spill clean-up, erosion controls) Review and conduct additional sampling of stormwater discharge, as required.
Sediment Build Up	Check for excessive build-up of sediment in stormwater system including pits and pipes. If sediment build-up is noted, identify source.	If sediment accumulates in stormwater pits and pipes, capacity reduction can occur. Excessive build-ups of sediments in Ecoceptor can reduce the effectiveness of the devices over time. Erosion and sedimentation of stored waste material may contribute to increased transport of pollutants.	Once sediment source has been identified, remove accumulated sediment by flushing the system and/or emptying the Ecoceptor.
Erosion or Scour	Check for erosion and scour around the structures. If scour is noted check for source of scour.	Erosion impairs filtration systems by preventing uniform distribution of flow through the system or cause damage.	Fill in holes with filter media. Provide energy dissipation to prevent further scour in the future.
Litter (anthropogenic)	Check for litter in and around process areas and structures	Litter can potentially block inlet and outlet structures resulting in flooding, as well as detract from the system's visual amenity.	Address source of litter with appropriate action. Remove litter.

Item being monitored	Monitoring Task	Purpose of Monitoring	Maintenance Action
Litter (organic)	Check for organic litter including leaves and sticks.	Organic litter can increase nutrients to the filtration systems. Accumulated organic matter can also create offensive odours and can reduce percolation of water in the filter media.	Identify and address sources of organic litter with appropriate action. Remove litter.
Inlet and Outlet Pits	Ensure inflow areas and grates over pits are clear of litter and in good condition. Check for dislodged or damaged pit covers and ensure safety and general structural integrity.	If pits become blocked it will significantly reduce the amount of stormwater entering the system. Pit covers could also be a safety hazard if not fitted correctly.	Remove debris, repair damage.
Devices			
Ecoceptor	Ensure the settlement collection chamber is not full. Check for dislodged or damaged covers and ensure general structural integrity of device. Maintenance is generally to be in accordance with the manufacturer's instructions and procedures.	If litter collection chamber is full then the device will be unable to collect gross pollutants from stormwater. Dislodged or damaged pit covers present a safety hazard.	Organise a vacuum truck to clean the device. Contact the manufacturer or contractor to repair any structural damage.
Rainwater Tank	Ensure downpipe leaf eaters, first flush devices and litter screens are unblocked and are operating correctly. Regularly check the structural integrity of the tank. Check for any accumulated litter, sediment, or debris on or within the tanks.	If any fixtures are not operating correctly, it is likely that sediment and debris will accumulate in the tank and reduce water quality. If the tank is not sound, it is likely to fail.	Remove any litter, settlement or debris from the devices. Repair or replace any damaged components. If any accumulation is found within the tank, then drain and flush the tank with potable water.
Sand filter	Monitor ponding and its duration compared to design infiltration period. Remove deposited sediment and debris from the sand level and inlet/outlet areas. Regularly check the structural integrity of hydraulic structures.	Failure of the sand filter to perform as designed may result in local overflows and/or sediment and nutrient deposit downstream.	Inspect sand level for erosion and scour. Replace sand and inspect drainage as appropriate.

Item being monitored	Monitoring Task	Purpose of Monitoring	Maintenance Action
Stormwater Quality			
Exceedance of water quality objectives	Condition L1 of the EPL states that the licensee must comply with section 120 of the POEO Act, which prohibits the pollution of waters. Stormwater quality should also meet FCC stormwater quality, discharge requirements or approval conditions. In the absence of any EPL or FCC criteria, site-specific risk-based screening criteria should be adopted from NSW EPA made or approved guidance appropriate for the commercial/industrial land use and heavily disturbed receiving environment. These include: ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* for heavily disturbed environments; and, primary contact recreation (PCR) guidelines adopted from National Health and Medical Research Council (NHMRC) (2011), *Australian Drinking Water Guidelines* and NHMRC (2008) *Guidelines for Managing Risks in Recreational Water*.	Verify soil and erosion, and stormwater, management controls in SSD-7401 are performing as designed.	Review the above triggers and actions.

4.3.6 Reporting

In general, consolidated reporting should combine results of surface water and groundwater monitoring. **Table 4.4** presents reporting requirements under the WMP.

Table 4.4 WMP Reporting Requirements

Report Type	Content
Quarterly Data Review	No report required, however, inspection and monitoring data should be consolidated and reviewed to assess: • Consistency with 'baseline' conditions and modelled conditions. • Whether any actions are triggered.
Annual Report	Interpretive annual reports shall document: • Details of monitoring scope and methods, including non-conformances with this program. • A plan showing monitoring locations. • Field and inspection records, calibration certificates and laboratory analytical certificates. • Tabulated sampling analytical results. • Review of exceedances of performance criteria against trigger and action levels or significant changes, including root cause and whether changes to the monitoring program are warranted. • Review of QA/QC. Reporting shall be conducted by a suitable qualified and experienced person. Periodic review of the trigger-response plan and monitoring program by a suitable qualified and experienced person.

5.0 Groundwater Management Plan

5.1 Groundwater Risks

Reported historical groundwater assessments completed by URS from 2008 to 2013 indicate that concentrations of TPH, PAH and phenols have been detected above laboratory limit of reporting (LOR) in the groundwater in limited locations. Additionally, elevated concentrations of metals were detected, which were attributed to the background composition of the local groundwater. A brief summary of historical results is provided in **Section 5.2**.

Despite the known history of contamination at the site, there is a low level of risk associated with these impacts due to the previously undertaken soil remediation, low vulnerability of the groundwater and the relative immobility of the groundwater. The nature of site activities such as processing drill muds and storing water on site suggests that there is potential, even if unlikely, for impact of the groundwater via the following mechanisms:

- Infiltration of wastewaters or process water from leaks or spills into soil and into the water table.
- Chemical spills or leaks caused by human error or inappropriate chemical storage practices.
- Migration of contamination from off-site sources of contamination such as neighbouring waste facility.
- Historic presence of underground storage tanks (USTs) and infrastructure associated with historic site uses, which have the potential to have formed unidentified plumes.

It is noted that impact, if any, to site groundwater does not represent an unacceptable risk, rather that there is a risk of groundwater travelling downgradient and discharging to Prospect Creek or to neighbouring sites.

5.2 Baseline Conditions

Historical groundwater gauging records, field-measured parameters and analytical data are provided in the groundwater assessment report completed by DP in 2016 (**Appendix C**).

The historic groundwater monitoring wells installed by URS were named MW01-MW13. A figure displaying the locations of the historic monitoring wells is provided in **Appendix C**. In summary:

- MW01 and MW02 were located adjacent to Davis Road and considered to be hydraulically downgradient of the site operations.
- MW03 was in the vicinity of the old weighbridge, which has now become the sand filter bed.
- MW04 and MW05 were located immediately downgradient of the historic bitumen tanks.
- MW06 and MW07 were located mid-site, where the current drill mud processing shed is located.
- MW08 was located immediately hydraulically down-gradient of the historic bitumen tanks.
- MW09 and MW10 were located immediately adjacent to an oil water interceptor pit and a former UST location.
- MW11 was located in the northern part of the site where drill muds are anticipated to be dumped into the facility hydro-tips.
- MW12 and MW13 were located at the northern extent of the site and can be considered background locations.

In section 8.1 of the groundwater assessment, DP (2016) concluded that:

"The proposed development is considered to have a negligible potential for significant interference with groundwater… and has a relatively low risk of discharging potential contaminants".

Further to this, a report by DP (2015) *Review of Contamination Reports Proposed Resource Recovery and Recycling Facility 24 Davis Road, Wetherill Park, NSW*, highlighted the following groundwater contamination comments:

Table 5.1 Historic Groundwater Assessments

Year	Findings	Reference
2006	Installation and sampling of 13 groundwater monitoring wells, no TPH was detected above the LOR. Elevated PAH was encountered in MW08. Elevated concentrations of metals including cadmium, chromium, lead, nickel, copper and zinc were encountered several wells across the site.	URS, Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW, 2006 (URS, 2006).
2008	Sampling 13 existing monitoring wells, TPH C10-C36 was detected in three wells (MW02, MW07 and MW09) below the adopted guidelines. Metals and PAH concentrations were generally consistent with previous monitoring. PAH was detected below the investigation level at MW02. Metals concentrations were consistent with the 2006 investigation.	URS, Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot, 24 Davis Road, Wetherill Park NSW, 2010 (URS, 2010)
2010	Sampled 13 existing monitoring wells. No non-aqueous phase liquid (NAPL) was encountered. TPH C10-C36 was detected in two samples (MW03 and MW09). Phenanthrene was detected in MW02 and phenol was detected in MW08 however these analytes were below investigation levels. Metals concentrations were above investigation levels in several wells but attributed to background levels.	URS, Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW, 2012 (URS, 2012a)
2012	Sampled 13 existing groundwater wells, all samples were below the adopted guideline values.	URS, Post Phase 2 Environmental Site Assessment, Former Mobile Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park, 2012 (URS, 2012b)
2013	A report documenting the decommissioning of the 13 URS wells located on site.	URS, Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park (6F01), 2013 (URS, 2013a)

Given the long period since these previous investigations, a supplementary baseline groundwater assessment should be conducted to establish baseline conditions for a wider range of chemicals of potential concern prior to the development commencing operation. These new and historical data should be analysed to represent site 'baseline' groundwater conditions for the reported key indicator analytes. The intention is for this data to be used in statistical comparison to ongoing monitoring data to assess changes to groundwater conditions as part of the trigger-response plan (**Section 5.5**). Statistical comparison should consider:

- Guidance for assessing, and comparison to, background water quality in ANZG (2018). This approach may be applied to 'baseline' conditions.
- Mann Kendall (or equivalent) analysis of statistically significant trends.

5.3 Monitoring Program

5.3.1 Existing Monitoring Network

It is understood that all historic wells installed by URS have either been decommissioned or demolished prior to the redevelopment of site. A new monitoring network is to be established to include the installation of 6 shallow groundwater monitoring wells that intersect the water table located within the shale bedrock.

These new wells are to be installed as part of the site infrastructure upgrades.

Senversa has designed an indicative groundwater monitoring network that seeks to characterise groundwater both hydraulically up-gradient and down-gradient of the site. The location of the proposed groundwater monitoring wells is presented on **Figure 2**. The groundwater monitoring network comprises:

- One well (MW06) that captures the quality of background groundwater migrating onto the site from the north.
- Five wells (MW01, MW02, MW03, MW04, MW05) placed in targeted locations with the following rationale.
    - MW01 – Down gradient of the stormwater treatment sand filter box.
    - MW02 – Down gradient of the Ecoceptor.
    - MW03 – Western site boundary down gradient of neighbouring property.
    - MW04 – Down gradient of the drill mud processing facility on eastern boundary.
    - MW05 – Middle level of site in the vicinity of the historic aboveground storage tanks (ASTs).

The wells will target the shallow groundwater as this is most susceptible to impact.

The monitoring network is considered adequate for the purposes of this WMP and to form a baseline characterisation of the groundwater on site. At the commencement of Stage 2 operations, an additional monitoring well should be installed targeting the FLD facility.

Installation of new wells shall follow guidance in National Uniform Drillers Licensing Committee (NUDLC) (Third ed.), *Minimum Construction Requirements for Water Bores in Australia* under supervision of a suitably qualified and experience person.

If wells are damaged and require further monitoring, they should be repaired by a suitably qualified and experienced person.

The top of casing and surrounding ground level of all newly installed wells will be surveyed by a licensed surveyor to m AHD elevation and Map Grid Australia (MGA) coordinate system (GDA 94 datum).

5.3.2 Monitoring Requirements

A baseline monitoring event shall be conducted, with ongoing groundwater monitoring conducted as stipulated in **Table 5.2**. Additional monitoring will likely be required - triggered as a response to changes in site activities such as the commencement of Stage 2 operations.

The monitoring locations, and sampling, analytical and reporting schedules are provided in the following table. These may be subject to change in accordance with the triggers and actions (**Section 5.5**Error! Reference source not found.).

Table 5.2 Groundwater Monitoring Frequency

Type	Frequency	Monitoring Aspect	Locations	Analytical Schedule	Reporting Schedule
Baseline	Sampling every 6 months for a two-year period	Gauging, sampling and analysis	MW01, MW02, MW03, MW04, MW05, MW06	Field: pH, electrical conductivity (EC), dissolved oxygen (DO) and redox potential. Laboratory: Ammonia (as N), nitrate, TN, TP, dissolved metals, TPH, BTEX, PAH.	Interpretive baseline report
Event	Triggered – additional processes, Stage 2 developments or storage of contaminating substances	Sampling and analysis*	As required*	As required*	Reporting as above

* The required sampling and analytical schedule should be assessed by a suitable qualified and experienced person at the time of the trigger response.

˜ dissolved metals shall include (at a minimum) arsenic, copper, lead, nickel, zinc, iron, manganese; BTEX – benzene, toluene, ethylbenzene and xylenes.

5.3.3 Sampling and Analytical Methods

Sampling shall be undertaken by a suitably qualified and experienced person consistent with guidance in:

- DEC (2004). *Approved Methods for Sampling and Analysis of Water Pollutants in NSW*. March 2004.
- AS/NZS 5667.1:1998, *Water Quality – Sampling* series.
- NEPC (2013). *Schedule B (2) Guideline on Site Characterisation*.

Appropriate data QA/QC procedures consistent with the above guidance shall be implemented and assessed as part of the program.

All analyses shall be conducted by a NATA accredited laboratory.

5.4 Assessment Criteria

Condition L1 of the EPL states that the licensee must comply with section 120 of the POEO Act, which prohibits the pollution of waters. Assessment of groundwater quality will principally be via comparison against baseline and site background conditions. **Table 5.3** below summarises the groundwater quality criteria to be adopted to assess whether pollution of waters may have occurred.

Table 5.3 Groundwater Assessment Criteria

Receptor	Adopted Assessment Criteria
Change to baseline / background conditions	No statistically significant increasing trend or 20% increase over baseline / background concentrations or field parameters.

Receptor	Adopted Assessment Criteria
Human Health	Relevant criteria in NEPC (2013) for the commercial/industrial land use setting should be adopted as a screening levels. This includes: • Direct contact criteria have also been considered due to the relatively shallow depth to groundwater in some locations. The presence of concrete and asphalt hardstand however indicates that groundwater will be predominantly inaccessible to humans. Drinking water guidelines will not be considered, given the site geology, land use and provision of a reticulated drinking water supply. • Health Screening Level (HSL) for commercial/industrial land use (HSL-D) for vapour intrusion, sand aquifer, 2-<4 m based on the presence of fill and clay in the subsurface the most conservative soil type of sand has been selected. • No gross aesthetic impacts such as non-aqueous phase liquids.
Ecological	Groundwater may migrate and discharge into Prospect Creek, which is the nearest surface water body down gradient of the site, though the ultimate receiving environment is the George's River and Botany Bay (marine). Northrop Pty Ltd (2017) indicate the local receiving waterways are heavily disturbed. The relevant ecological guidelines for toxicants, are therefore, the fresh water default guidelines values for heavily disturbed environments from ANZG (2018). • ANZG (2018) notes that exceedance of a DGV does not necessarily imply that there is an inherent risk, rather that further assessment and monitoring may be required prior to implementing appropriate management actions. These values should be used as 'triggers' for further assessment. These may be applied for screening purposes for groundwater that has the potential to migrate from the site.

It is noted that these criteria for groundwater monitoring are for screening purposes to trigger further assessment (and are not appropriate to directly assess the level of risk to any identified receptors).

5.5 Triggers and Action Responses

Trigger levels and action responses to be applied to the groundwater monitoring program are presented in **Table 5.4** below.

Table 5.4 Groundwater Management Plan Trigger Level and Action Responses

Aspect	Trigger	Actions
Groundwater	Concentrations of key indicator analytes outlined in **section 4.3.3** exceed performance criteria and do not show a stable or decreasing trend.	Consider re-sampling or increased sampling frequency to confirm results. Assess possible sources of contamination – i.e. change in site operations, change in neighbouring site operations or chemical spills. Assess the significance of associated environmental risk – where a potentially unacceptable risk is identified, a suitably qualified and experienced professional should assess whether the monitoring program is adequate to assess potential contamination risks, and recommend program changes (if necessary) (e.g., additional sampling locations, more frequent monitoring or different contaminants of concern). Implement the amended monitoring program. Develop and implement management/remedial actions if necessary.
	Concentrations of key indicator analytes in **section 4.3.3** that are **less than** the performance criteria and show statistically significant stable or decreasing trend over a minimum of three events.	Assessment to determine the residual environmental risk and review the monitoring program by a suitable qualified and experienced professional. If monitoring results are consistently decreasing to levels below the performance guidelines outlined in **Section 5.4** and the residual environmental risk from ongoing primary sources is considered low by a suitably qualified and experienced professional, the groundwater monitoring program may end.

Aspect	Trigger	Actions
	Damaged or lost wells	Assess whether ongoing monitoring at the location is necessary. If required, repair or re-install the well.
Site Activities	Incident (e.g. spill or release of a material or liquid) that could result in impact to surface or groundwater.	Assess whether monitoring program is adequate to assess potential impact associated with the incident. This assessment should be undertaken by a suitable qualified and experienced professional and documented in a report with clear conclusions and recommendations for amendments (if necessary). Implement program changes – these may include increased monitoring frequency, inclusion of additional monitoring locations, installation and monitoring of additional wells, broader analytical suite to assess the chemicals of concern.
	Change in nature or management of imported materials that has the potential to result in a significantly increased risk of impact from leachate. Including commencement of Stage 2 operations.	

5.6 Reporting

Table 5.5 presents the minimum reporting requirements for groundwater monitoring reports.

Table 5.5 Groundwater Management Plan Reporting Requirements

Report Type	Content
Baseline Groundwater Assessment Report (following completion of sampling)	• Details of monitoring scope and methods, and any non-conformances with this WMP. • Digitisation and analysis of historic groundwater monitoring results. • A plan showing monitoring locations. • A plan showing groundwater elevations and inferred flow. • Field records, calibration certificates and laboratory analytical certificates. • Combined results for the first four monitoring events, including summary tables of gauging, field measurements and analytical data. • Comparison of analytical results against performance criteria and historic results. • Review of QA/QC. • Statistical analysis of historical data for key chemicals of concern, including the mean, minimum, maximum, 80th percentile of site background groundwater quality (MW06) and baseline groundwater quality (at newly installed wells) to allow future comparison to monitoring data. • Reporting shall be conducted in accordance with NSW EPA made or approved guidance.
Data Report (annual)	• Details of monitoring scope and methods, and any non-conformances with this WMP. • A plan showing monitoring locations. • Field records, calibration certificates and laboratory analytical certificates. • Tabulated results (gauging, field measurements and analytical data). • Comparison of analytical results against performance criteria and baseline.
Interpretive Report (every 3 years)	As per baseline report and: • Present details of any incidents, complaints, spillages or required corrective actions. • Trend analysis. • Assessment of exceedances of performance criteria against trigger and action levels, including assessment of source, nature and extent of impact. • Review trigger-response plan and monitoring program. • The interpretive report should encompass the previous three years of monitoring events and the baseline data to assess ongoing groundwater monitoring requirements.

6.0 Principles and Limitations of Report

The following principles (summarised in **Table 6.1** below) are intended to be referred to in resolving any ambiguity or exercising such discretion.

Table 6.1 Principles and Limitations of Report

Area	Principle and Limitation
Limitations of Information	This WMP has been prepared by Senversa for the use of Space Urban Pty Ltd and reDirect Recycling Pty Ltd. The sources of information used by Senversa are outlined in this Report. In preparing the Report, Senversa has relied upon information regarding the Resource Recovery Facility prepared by companies including but not limited to Douglas Partners, Eclipse Environmental, Northrop, URS, reDirect, RPS and Urban Pty Ltd and no independent verification of this information has been made beyond the agreed scope of works and we assume no liability for any inaccuracies in or omissions to that information. No indications were found during our development of the Report that information contained in this Report as provided to Senversa was intentionally false.
Level of Assessment	Senversa prepared this Report in a manner consistent with the level of care and skill ordinarily exercised by members of Senversa's profession practicing in the same locality under similar circumstances at the time the services were performed.
Nature of Advice	This Report should be read in full. No responsibility is accepted for use of any part of this Report in any other context or for any other purpose or by third parties. Senversa does not seek or purport to provide legal or business advice.

7.0 References

Advanced Environmental Dynamics (2021). *Wetherill Park Resource Recovery and Recycling Facility - Air Quality and Odour Management Plan,* November 2021.

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Fairfield City Council (2017). *Stormwater Management Policy*. September 2017.

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New South Wales Department of Planning, Industry and Environment (2021). *Bettergrow Resource Recovery Facility, Wetherill Park, Modification 1, Increased processing Capacity, Additional Wastes Streams and New Shedding, State Significant Development Modification Assessment (SSD-7401-Mod-1).* April 2021. NSW DPIE.

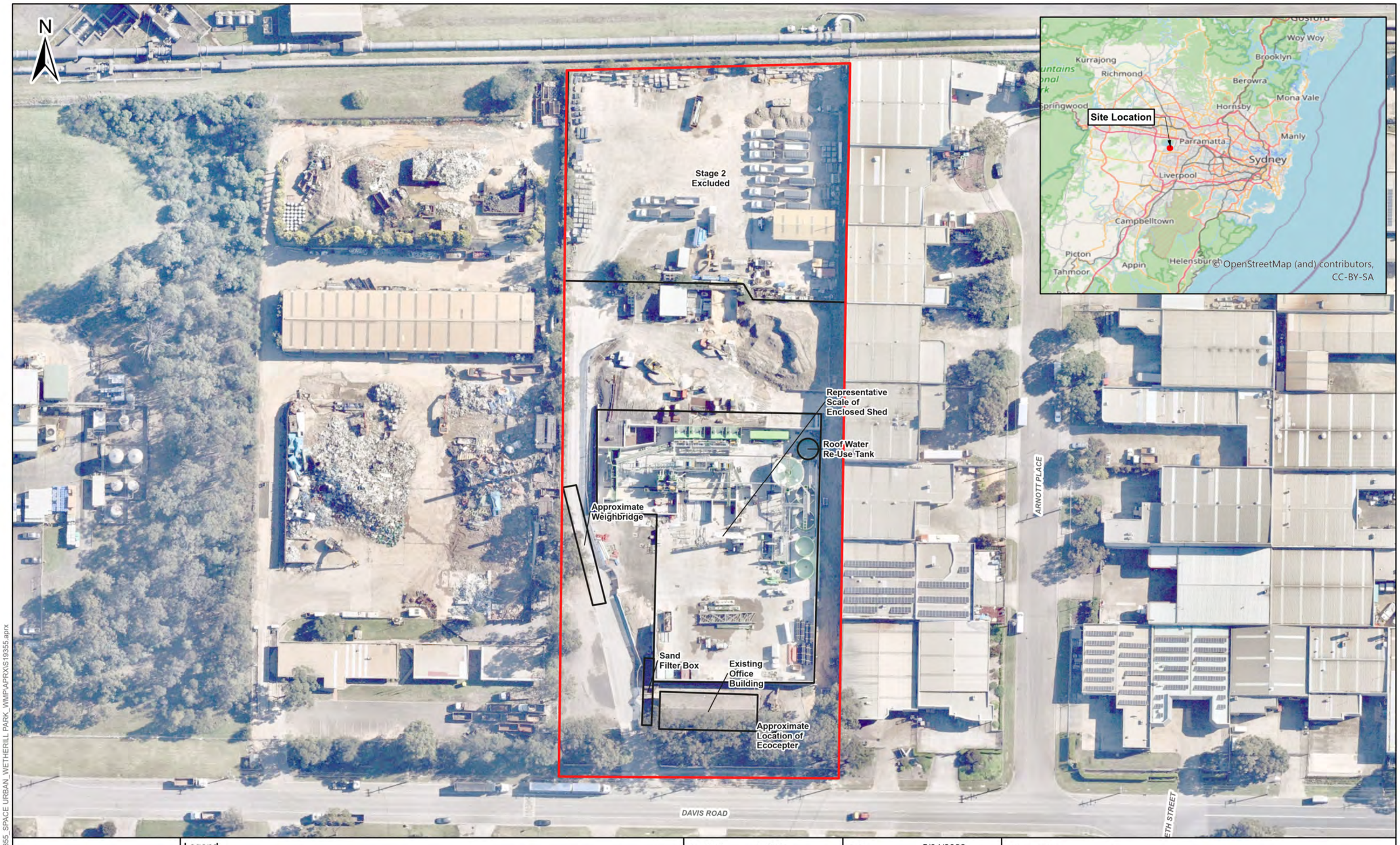
Northrop Pty Ltd (2017). *Surface Water Assessment for 24 Davis Road, Wetherill Park, Proposed Resource Recovery and Recycling Centre,* February 2017.

reDirect Recycling (2021). *Pollution Incident Response Management Plan, reDirect Recycling, 24 Davis Road, Wetherill Park, NSW.* 13 November 2021.

RPS Group (2020). *Statement of Environmental Effects – Modification of the Bettergrow Resource Recovery and Recycling Facility – 24 Davis Road, Wetherill Park, NSW SSD7401*. September 2020.

Space Urban (2021). *Proposed modification to SSD-7401 – 24 Davis Road, Wetherill Park, NSW*. 25 August 2021.

Figures



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senversa

Legend

- Site Boundary
- Site Features

Notes:
Aerial Imagery (17/10/2021) © Nearmap

Created:	T. Sohi	Date:	5/04/2022
Reviewed:	M. Coles	Revision:	0
Approved:	E. Walsh	Scale:	1:1,100 (A3)
File:	S19355_002_F001_Site Location and Layout Plan		

0 5 10 20 30 40 50 Metres

Coordinate System: GDA 1994 MGA Zone 56

Figure No: 1

Title: Site Location & Layout Plan

Project: Water Management Plan

Location: 24 Davis Road, Wetherill Park NSW

Client: Space Urban

Legend

- Site Boundary
- Proposed Groundwater Monitoring Well
- Surface Water Sample
- Inferred Groundwater Flow Direction

Notes:
Aerial Imagery (17/10/2021) © Nearmap

Created:	T. Sohi	Date:	5/04/2022
Reviewed:	M. Coles	Revisicn:	0
Approved:	E. Walsh	Scale:	1:1,000 (A3)

File: S19355_002_F002_Surface Water and Groundwater Sampling Locations

0 5 10 20 30 40 50 Metres

Coordinate System: GDA 1994 MGA Zone 56

Figure No: 2

Title: Proposed Surface Water and Groundwater Sampling Locations

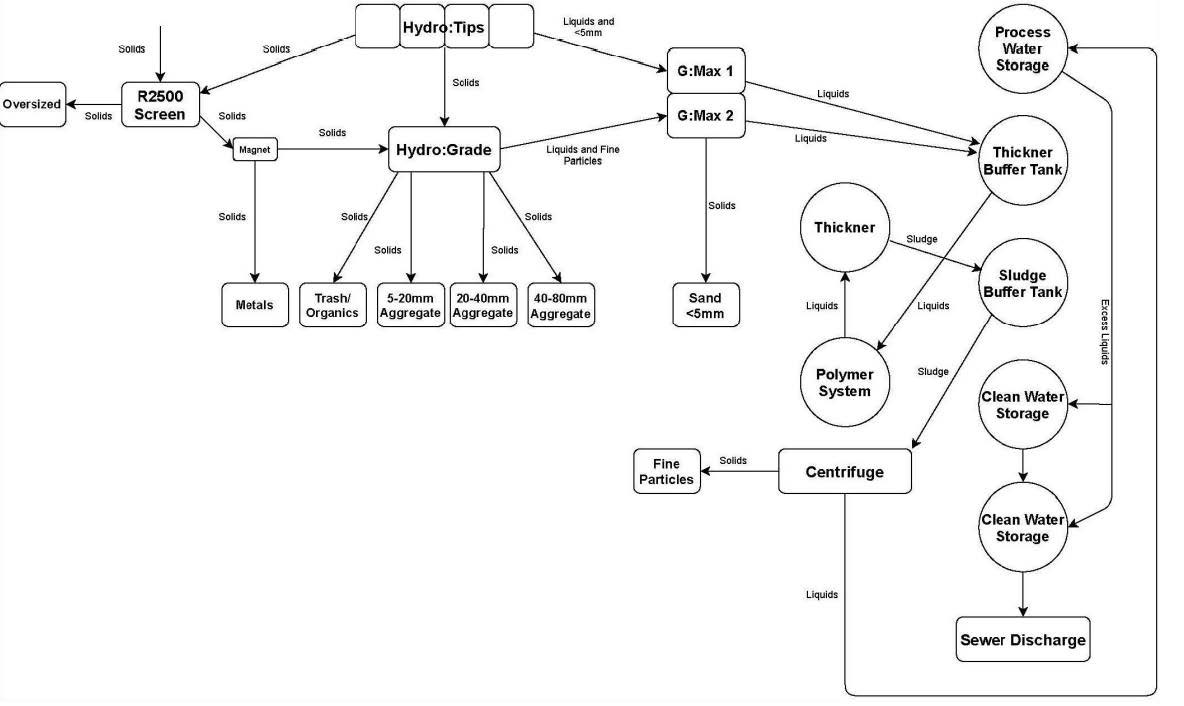
Project: Water Management Plan

Location: 24 Davis Road, Wetherill Park NSW

Client: Space Urban

Path: S:\01_Jobs\1.NSW_Jobs\S19355_SPACE URBAN_WETHERILL PARK_WMP\APRX\S19355.aprx

Appendix A: Process Flow Diagram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Solids
Liquids and <5mm
Oversized
Solids
R2500 Screen
Solids
Solids
Magnet
Solids
Hydro:Grade
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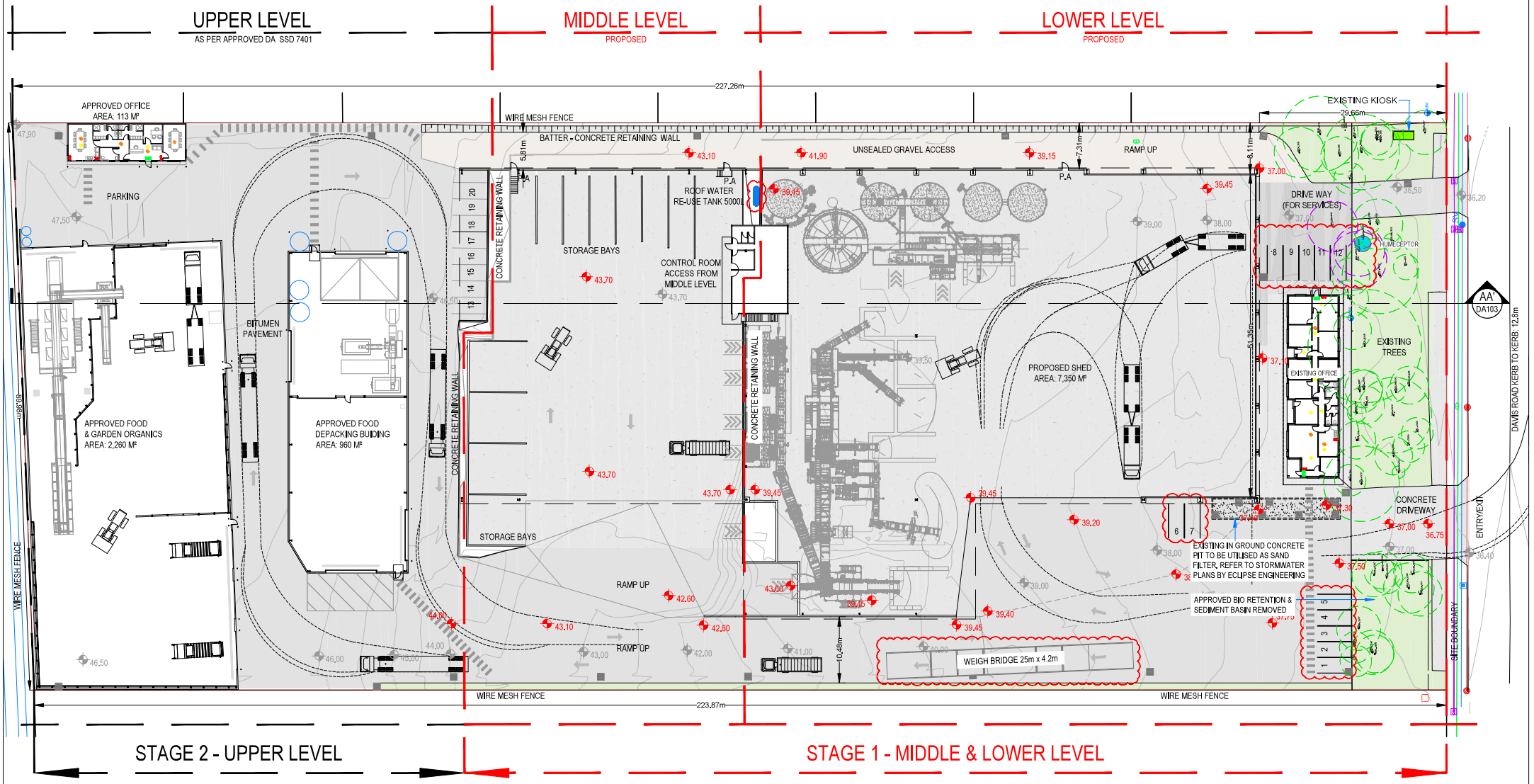
G:Max 1
G:Max 2
Liquids
Liquids
Process Water Storage
Thickner Buffer Tank
Solids
Solids
Solids
Solids
Solids
Metals
Trash/ Organics
5-20mm Aggregate
20-40mm Aggregate
40-80mm Aggregate
Sand <5mm
Thickner
Sludge
Sludge Buffer Tank
Liquids
Liquids
Polymer System
Sludge
Excess Liquids
Clean Water Storage
Fine Particles
Solids
Centrifuge
Clean Water Storage
Liquids
Sewer Discharge

Appendix B: Site Plan



01 PROPOSED SITE PLAN AT GROUND LEVEL
SCALE: 1:300 (A1)

LEGEND:

- 39.50 EXISTING SITE SPOT LEVELS
- TRUCK MOVEMENT
- EXISTING TREE & CANOPY TO BE RETAINED
- 39.45 PROPOSED SITE SPOT LEVELS (RED IN COLOUR)

NOTES:

TOTAL SITE AREA:	20,280m²
TOTAL ROOFED AREA:	11,450m²

ISSUE	DESCRIPTION	DATE	DRAWN	AUTH
D	Weigh Bridge / Parking / WT / Humeceptor	04-11-2021	JU	GD
C	Existing Pit / Sand Filter / Existing CPW / WT	05-10-2021	JU	GD
B	Deleted basin / Added inground sand filter	24-08-2021	JU	GD
A	Development Application	19-08-2020	DC	MD/JB

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CROSSMULLER CONSTRUCTION
OFFICE:
2 WELLA WAY SOMERSBY, N.S.W. 2250 AUSTRALIA
Tel: 02 4340 9800 Fax: 02 4340 9293

PROJECT
PROPOSED BETTERGROW RESOURCE RECOVERY FACILITY

LOCATION
24 DAVIS ROAD
WETHERILL PARK NSW 2164

DRAWING
PROPOSED SITE PLAN AT GROUND LEVEL

SCALE	STAGE
1:300 @ A1, 1:600@A3	DA

PROJECT NUMBER	DRAWING NUMBER	ISSUE
2020/04	DA004	D

Appendix C: Historic Groundwater Monitoring Information

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Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on Groundwater Assessment

Proposed Resource Recovery & Recycling Centre
24 Davis Road, Wetherill Park

Prepared for
Bettergrow Pty Ltd

Project 85126.01
September 2016

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	85126.01	Document No.	R.001.Rev0
Document title	Report on Groundwater Assessment Proposed Resource Recovery & Recycling Centre		
Site address	24 Davis Road, Wetherill Park		
Report prepared for	Bettergrow Pty Ltd		
File name	85126.01.R.001.Rev0.GW		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Draft A	Nerilee Edwards	Michael J Thom	22 March 2016
Revision 0	Nerilee Edwards	Michael J Thom/ Fiona MacGregor	20 September 2016

Distribution of copies

Status	Electronic	Paper	Issued to
Draft A	1	0	RPS (Shaun Smith)
Revision 0	1	0	RPS (Shaun Smith)

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

	Signature	Date
Author		20 September 2016
Reviewer		20 September 2016

bsi. ISO 9001 Quality Management

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Executive Summary

This report presents the results of a groundwater assessment undertaken for a proposed resource recovery & recycling centre at 24 Davis Road, Wetherill Park. This assessment was undertaken to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Greenspot Resource Recovery Centre (SSD 7401).

The specific SEARs are address in the following locations:

SEAR	Location in Report/ Comment
DPI Attachment A	
Groundwater Assessment	
The known or predicted highest groundwater table at the site.	Section 4.3, Table 4
Works likely to intercept, connect with or infiltrate the groundwater sources.	Section 8.1
Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.	No extraction proposed
Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used consistent and unique bore identifiers for all future reporting.	No bores requiring registration with DPI proposed at this stage.
A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).	Sections 3, 4.3, 6
Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.	Section 3.5, 4.3 and recommendations in Section 8.3
The predicted impacts of any final landform on the groundwater regime.	Section 8.1
The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	Sections 3.4.1, 3.5, 3.6, 5.2, 8
An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.	Sections 3.4, 4, 7
An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).	Sections 4, 7, 8

SEAR	Location in Report/ Comment
DPI Attachment A	
Measures proposed to protect groundwater quality, both in the short and long term.	Section 8.3
Measures for preventing groundwater pollution so that remediation is not required.	Section 8.3
Protective measures for any groundwater dependent ecosystems (GDEs).	No potential for impact identified
Proposed methods of the disposal of waste water and approval from the relevant authority.	No groundwater extraction to form waste water or disposal of waste water to groundwater proposed.
The results of any models or predictive tools used.	No applicable
Where potential impacts are identified…	No potential impacts identified
Groundwater Dependent Ecosystems	Discussed briefly in Section 3.5. No GDE relying on groundwater from the site identified
Watercourses, Wetlands and Riparian Land	Discussed briefly in Sections 3.6 and 5.2. No impacts predicted

Overall, it is considered that the proposed development poses a low risk of significantly impacting groundwater supply or quality. Specifically:

- **Beneficial Groundwater Use**
  Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site.

  Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and DPI registered bores do not show any current beneficial use in the area of the site.

  The proposed development is considered to have a negligible risk of impacting the quality or supply of groundwater at the site.

- **Groundwater Dependent Ecosystems**
  There are no high priority GDE within or near the site. The proposed development is not considered to present a potential risk to GDE.

- **Impacts on Bores and Natural Drainage Features**
  The proposed development is not considered to present a potential risk to bores or natural drainage features.

As with any activity, appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required, and will mitigate further the already low risk posed by the development on groundwater at the site.

Areas where liquid wastes or dangerous goods are to be handled should have appropriate containment measures to prevent leachate/ spillage from entering the ground. This will include, as a minimum, the proposed tipping pit in the Food Depackaging and Process Building. Containment

measures should include an impermeable liner (e.g. HDPE or a compacted clay layer), bunding and spillage/ overflow contingency measures.

Furthermore, the currently proposed excavation level for the tipping pit (in the order of 43 m AHD) will require appropriate design in consideration of it extending below the water table measured in the two previous wells located closest to the proposed pit. This may trigger the NSW Aquifer Interference Policy, administered by NOW. This design could include tanking or an appropriately drained system (if approved by NOW). Alternately the pit could be redesigned to reduce potential interaction with groundwater as discussed below.

If the pit is to be redesigned to reduce the potential for interference with groundwater, it is recommended that the excavation level (i.e. to the base of the sub-grade) be no lower than 44.5 m AHD, i.e. at least 0.5 m above the highest recorded groundwater level in the two former wells located closest to the pit (MW10 and MW11). It is considered that this would result in minimal interference of the pit with groundwater during normal conditions, although groundwater could potentially rise to the level of the pit during high rainfall events. As such an appropriate pressure relief system/ valve would need to be installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events. The pressure relief system would need to be designed to minimise the potential for leakage of leachate through the impermeable lining. Any water ingressing through this system would need to be managed and disposed of as potentially contaminated leachate.

If groundwater is encountered during construction of foundations for any of the proposed new structures it is expected to comprise water in the Bringelly Shale aquitard. The water would be expected to be of limited quantity, connectivity and of low quality with respect to potential for beneficial use. Standard construction and water management/ disposal methods are considered suitable for any water encountered under this scenario.

It is considered appropriate to construct monitoring wells into the upper weathered shale profile to obtain background groundwater quality for comparison purposes in the future. Monitoring at 6 monthly intervals over a period of two years would provide a good background dataset for the proposed development. If the monitoring identified significant variation in the groundwater quality, further monitoring should be undertaken to provide a better understanding of the background conditions and variability.

If a potentially contaminating substance is to be stored or used on the site in the future, further groundwater monitoring should be undertaken, if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater.

In the event of a leakage or spillage of leachate or other potentially contaminating liquid, assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and/ or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds.

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Table of Contents

Table of Contents

Report on Groundwater Assessment
Proposed Resource Recovery & Recycling Centre
24 Davis Road, Wetherill Park

1. Introduction

1.1 Background and Purpose

This report presents the results of a groundwater assessment undertaken for a proposed resource recovery & recycling centre at 24 Davis Road, Wetherill Park. The investigation was requested by Mr Neil Schembri of Bettergrow Pty Ltd dated 22 January 2016 and was undertaken in accordance with Douglas Partners' proposal SYD151689 Rev1 dated 19 January 2016.

This assessment was undertaken to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Greenspot Resource Recovery Centre (SSD 7401), specifically the report addresses the NSW Department of Primary Industries requirements from the document titled *Bettergrow Recycling Facility, Wetherill Park (SSD_7401) Request for input into the Secretary's Environmental Assessment Requirements*, dated 7/12/2015.

1.2 Site Identification and Summary Information

Site information is summarised below in Table 1, and a current site layout plan is provided in Appendix A.

Table 1: General Site Information

Item	Description
Site Address	24 Davis Road, Wetherill Park NSW
Lot and DP Number	Lot 18 Deposited Plan 249417
Local Government Authority	Fairfield City Council
County/Parish	Parish of St Luke and the County of Cumberland
Total Site Area	Approximately 20,028 m^2
Current Zoning	IN2, General Industrial under Fairfield LEP 2013
Site Owner	Mobil Oil Australia Pty Ltd
Proposed Site Lessee/Occupier	Bettergrow Pty Ltd
Current Site Use	Vacant
Previous Site Use(s) (URS 1012b, refer to Section 4.1)	<~1966 Possible pastoral uses ~1966-1978 Possible unknown industrial ~1978-2004: Asphalt batching plant >~2004: Vacant
Proposed Future Land Use	Resource Recovery and Recycling Centre
Adjacent Land Use	North: Sydney Water pipeline then Walder Park (within the Western Sydney Parkland) then Prospect Reservoir East: Light industrial units South Light industrial, including smash repair West: Scrap metal facility

1.3 SEARs Requirements

This report addresses the Sears Attachment 2, NSW Department of Primary Industries (DPI), Attachment A, Groundwater Assessment requirement. Locations of specific items within this report are provided in Table 2, below. In addition, this report has briefly commented on Groundwater Dependent Ecosystems and Watercourses, Wetlands and Riparian Land.

Table 2: SEARs Requirements

SEAR	Location in Report/ Comment
DPI Attachment A	
Groundwater Assessment	
The known or predicted highest groundwater table at the site.	Section 4.3, Table 4
Works likely to intercept, connect with or infiltrate the groundwater sources.	Section 8.1
Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.	No extraction proposed
Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used consistent and unique bore identifiers for all future reporting.	No bores requiring registration with DPI proposed at this stage.
A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).	Sections 3, 4.3, 6
Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.	Section 3.5, 4.3 and recommendations in Section 8.3
The predicted impacts of any final landform on the groundwater regime.	Section 8.1
The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	Sections 3.4.1, 3.5, 3.6, 5.2, 8
An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.	Sections 3.4, 4, 7
An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).	Sections 4, 7, 8
Measures proposed to protect groundwater quality, both in the short and long term.	Section 8.3

SEAR	Location in Report/ Comment
DPI Attachment A	
Measures for preventing groundwater pollution so that remediation is not required.	Section 8.3
Protective measures for any groundwater dependent ecosystems (GDEs).	No potential for impact identified
Proposed methods of the disposal of waste water and approval from the relevant authority.	No groundwater extraction to form waste water or disposal of waste water to groundwater proposed.
The results of any models or predictive tools used.	No applicable
Where potential impacts are identified…	No potential impacts identified
Groundwater Dependent Ecosystems	Discussed briefly in Section 3.5. No GDE relying on groundwater from the site identified
Watercourses, Wetlands and Riparian Land	Discussed briefly in Sections 3.6 and 5.2. No impacts predicted

2. Objectives and Scope of Work

The objectives for the assessment were to:

- Assess the geological and hydrogeological conditions and likely groundwater quality at the site and local area; and
- Assess the potential of the proposed development to impact groundwater or groundwater dependent ecosystems.

The scope of work included:

- Review of published mapping of regional topography, geology, soils and water bodies;
- Review readily available documents providing pertinent information on the regional geology and hydrogeology;
- Review groundwater bore registered with the NSW Department of Primary Industry, Office of Water);
- Review the applicable Water Sharing Plan, background document, and catchment status report(s);
- Review relevant, available previous reports;
- Inspection of the site and nearby down-gradient surface water bodies;
- Review supplied information on the proposed development;
- Assess the potential risks posed on groundwater and GDE from the proposed development; and
- Comment on contingency measures for the event that groundwater is intercepted, and appropriate measures to ensure that groundwater is not contaminated.

3. Regional Information

3.1 Regional Topography and Surface Water

A review of the local topographic mapping and watercourses was undertaken, and an extract with 2 m contour intervals is provided in Figure 1, below.

The site is located down-gradient of Prospect Reservoir, with Prospect Dam located approximately 600 m north of the site. The spillway from Prospect Reservoir releases water into Prospect Creek. Prospect Creek flows generally in a north-west to south-east direction, passing within approximately 700 m of the site to the east. Prospect Creek flows into the Georges River at Georges Hall.

An unnamed tributary of Prospect Creek flows generally in a west-south-west to east-north-east direction passing within approximately 450 m of the site to the south/ south east. Surface water from the site is expected to drain into this unnamed watercourse.

The site is located on the northern slopes of a small valley associated with this unnamed tributary. The site slopes generally down towards the south, with topographical mapping (refer to Figure 1) showing the landform at the site has been considerably modified. A local high is present to the east of the site, and the original site gradient may have naturally been slightly more westerly than currently exists.

Figure 1: Regional Topography (2m contours) and Watercourses (red pin shows site location)

3.2 Regional Geology

Regional geological mapping is shown in Figure 2, below.

Reference to the Penrith 1:100,000 Geological Series Sheet indicates that the site and surrounding area is generally underlain by Bringelly Shale of the Wianamatta Group. Bringelly Shale comprises Middle Triassic Shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff.

Sandstone constitutes about 20-30% of the Bringelly Shale though mainly in the top half of the formation. Sandstone beds are typically less than 2 m thick and rarely more than 6 m, with a few units persistent enough to rate definition as members (McNally, 2004[1]).

Maximum thicknesses quoted below have been sourced from the Geoscience Australia *Australian Stratigraphic Units Database*[2].

The Wianamatta Group (maximum thickness of 300 m), consists of three formations, from top to bottom, Bringelly Shale (maximum thickness of 257 m), Minchinbury Sandstone (in the order of 7 m thick[3]) and Ashfield Shale (maximum thickness of 62 m).

The Wianamatta Group is underlain by the Mittagong Formation and Hawkesbury Sandstone. The Mittagong Formation comprises interbedded shale, laminite and medium-grained quartz sandstone (maximum thickness 10 m). Hawkesbury Sandstone comprises Triassic age medium to coarse grained quartz sandstone with very minor shale and laminite lenses (maximum thickness of 290 m).

Quaternary Fluvial sediments comprising medium-grained sand, clay and silt are mapped in Prospect Creek and the unnamed tributary.

An outcrop of the igneous Prospect Picrite is present to the north east of the site.

[1] McNally, G 2004, 'Shale, Salinity And Groundwater In Western Sydney', Australian Geomechanics Vol 39 No 3, September 2004 pp107-122 (McNally, 2004)
[2] http://dbforms.ga.gov.au/pls/www/geodx.strat_units.int
[3] Lovering, J. F., 1954. The stratigraphy of the Wianamatta Group Triassic System, Sydney Basin. *Records of the Australian Museum* 23(4): 169–210, plate xii. [25 June 1954].

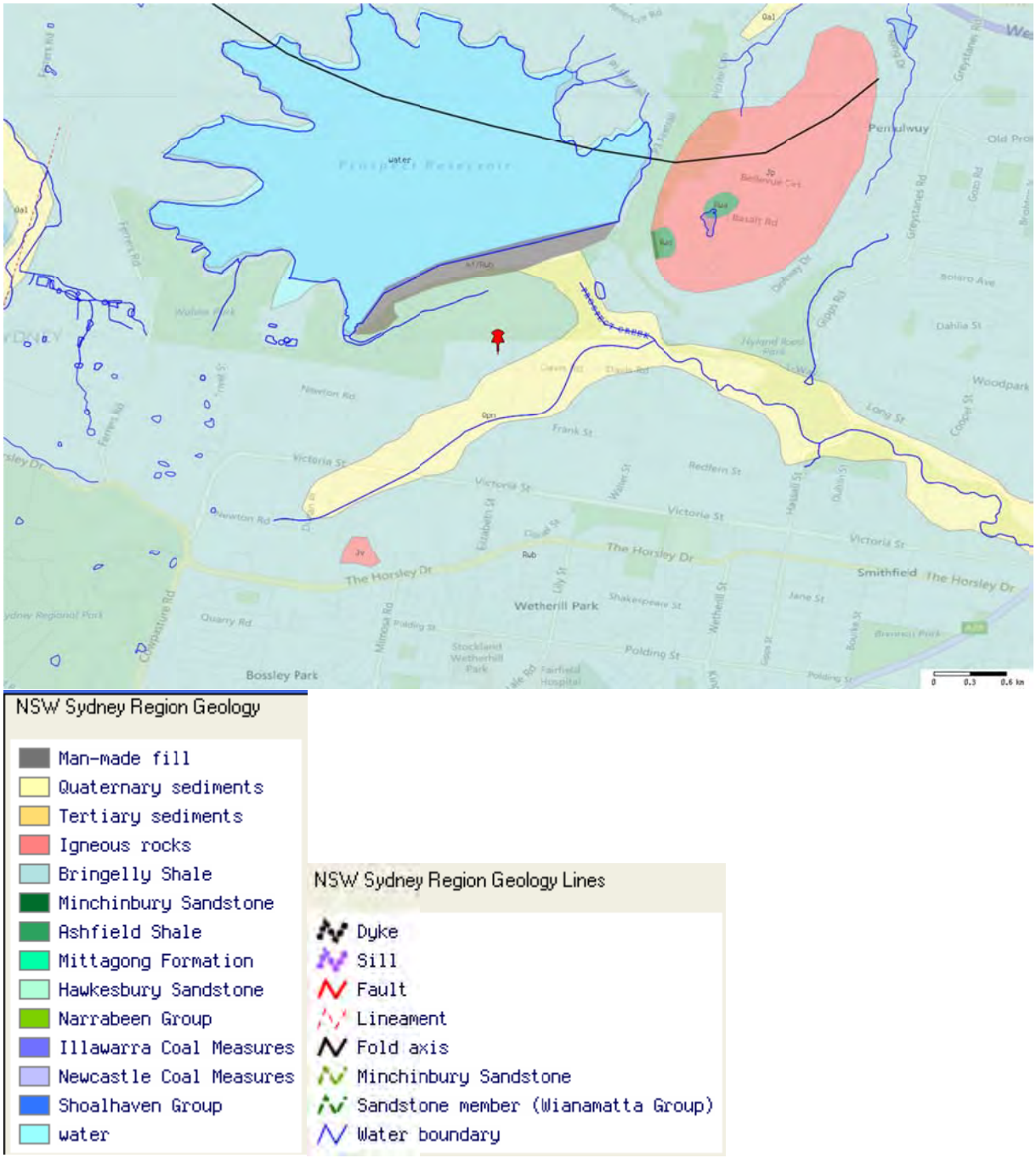

Figure 2: Regional Geology and Legend (red pin shows site location)

3.3 Soil Landscape Mapping

Reference to the Penrith 1:100,000 Soils Landscape Sheet indicates that the site is located within the Blacktown residual soil landscape area. The soil landscape is described as gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone. Local relief is to 30 m and slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes are typical. Limitations are given as moderately reactive highly plastic subsoil, low soil fertility, poor soil drainage.

The *Map of Salinity Potential in Western Sydney*, 2002 (NSW Department of Infrastructure, Planning and Natural Resources) indicates that the site has a moderate salinity potential.

3.4 Groundwater

3.4.1 Registered Groundwater Bore Database

A search was undertaken of registered groundwater bores in the NSW Department of Primary Industry (DPI), with the results summarised in Table 3 and Figure 3 below, and Work Summary Sheets for each bore are provided in Appendix B.

Twenty three bores were registered within 1 km of the site, four of which were within 500 m of the site. Twenty two of the bores were shallow (<10m depth) monitoring wells, with only limited data recorded.

The remaining bore, Bore No. GW109317, was a test bore drilled to 165 m located approximately 1 km north east (cross-gradient) of the site. It encountered four water bearing zones between 53 m and 164 m depth, all recorded as having a thickness of 0.1 m to 1 m and associated with fractured shale or sandstone bedrock. Yields were recorded between 0.45 L/s and 2.1 L/s and salinity was recorded between 6,000 mg/L and 10,000 mg/L.

The lack of active producing bores in the vicinity of the site is indicative of groundwater not being an economic resource in the area due to the high salinity of water from the Bringelly and Ashfield Shales.

Table 3: Summary of DPI Borehole Records

Bore No.	Location	Direction from site	Well Depth	Aquifer Depth	Standing Water Level	Yield	Salinity	Geology	Purpose
			m	m	m	L/sec	mg/L		
BORES WITHIN 500m OF SITE									
GW103822	153 NEWTOWN RD	SW	9	-	-	-	-	-	Monitoring
GW103823	153 NEWTOWN RD	SW	15	-	-	-	-	-	Monitoring
GW103824	153 NEWTOWN RD	SW	15	-	-	-	-	-	Monitoring
GW111392	29C DAVIS ROAD	E	6	-	-	-	-	clay & shale	Monitoring
BORES WITHIN 0.5-1km OF SITE									
GW105474	39-41 FRANK ST	SE	9.3	-	-	-	-	shale	Monitoring
GW105475	39-41 FRANK ST	SE	9.5	-	-	-	-	shale	Monitoring
GW105476	39-41 FRANK ST	SE	9.5	-	-	-	-		Monitoring
GW109317	LOT 2 HASSALL ST, BORAL RESOURCES	NE	165	53-54; 101.5-101.6; 127.1-127.2; 163.8-163.9	19	0.45; 0.15; 0.7; 2.1	6,050; 6,150; 10,000; 10,000	interbedded shale, siltstone & sandstone	Test bore, cancelled
GW110063	428-440 VICTORIA ST	S	5	-	-	-	-	clay & shale	Monitoring
GW110064	428-440 VICTORIA ST	S	1.1	-	-	-	-	fill	Monitoring
GW110065	428-440 VICTORIA ST	S	4.9	-	-	-	-	clay & shale	Monitoring
GW110066	428-440 VICTORIA ST	S	4.2	-	-	-	-	clay & shale	Monitoring
GW110067	428-440 VICTORIA ST	S	4.2	-	-	-	-	clay	Monitoring
GW110068	428-440 VICTORIA ST	S	5	-	-	-	-	clay & shale	Monitoring
GW110069	428-440 VICTORIA ST	S	3.9	-	-	-	-	clay & shale	Monitoring
GW110070	428-440 VICTORIA ST	S	5.1	-	-	-	-	clay & shale	Monitoring
GW110071	428-440 VICTORIA ST	S	5.1	-	-	-	-	clay & shale	Monitoring
GW110072	428-440 VICTORIA ST	S	4	-	-	-	-	clay & shale	Monitoring
GW111391	29C DAVIS ROAD	E	6	-	-	-	-	clay	Monitoring

Bore No.	Location	Direction from site	Well Depth	Aquifer Depth	Standing Water Level	Yield	Salinity	Geology	Purpose
			m	m	m	L/sec	mg/L		
GW111878	35 - 37 FRANK ST	SE	5.5	-	-	-	-	clay & shale	Monitoring
GW111879	35 - 37 FRANK ST	SE	5.8	-	-	-	-	clay & shale	Monitoring
GW111880	35 - 37 FRANK ST	SE	6.2	-	-	-	-	clay & shale	Monitoring
GW111881	35 - 37 FRANK ST	SE	6.5	-	-	-	-	clay & shale	Monitoring

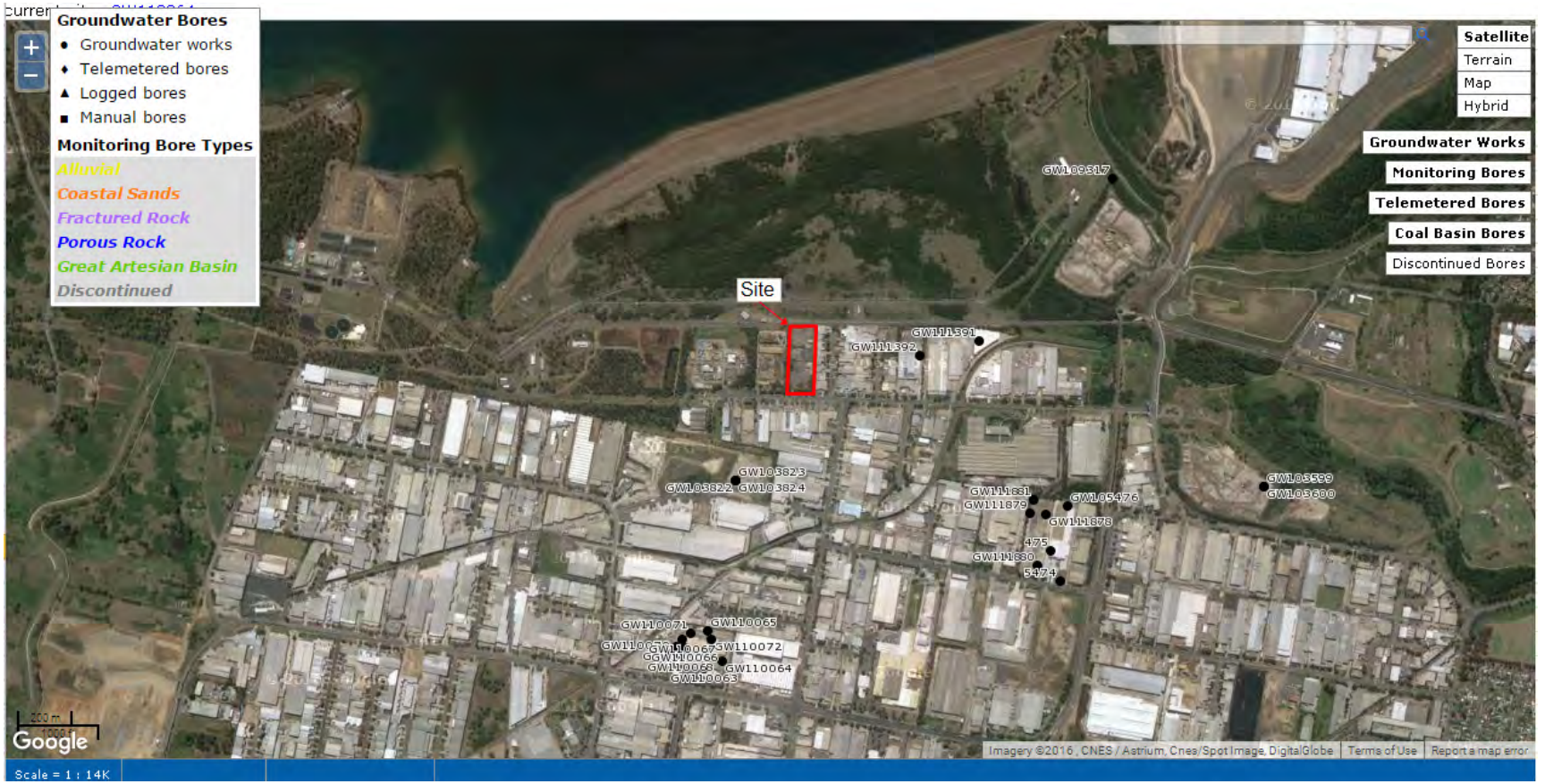

Figure 3: DPI Registered Bores

3.4.2 Formation Characteristics

Bringelly and Ashfield Shale are best considered as aquitards, due their generally low permeability and poor ability to support producing wells.

McNally (2004) provides a review of groundwater in the Wianamatta Group as it relates to salinity, and describes the Group as having two general water bearing horizons. The upper water bearing horizon being the regolith to typical depths of 3-10 m, comprises scattered zones of fracture porosity within the weathered shale and soil profile, with typical bulk hydraulic conductivity of 10^{-6} to 10^{-9} m/s. The lower second water bearing horizon is at depth in the unaltered shale bedrock with typical bulk hydraulic conductivity of 10^{-7} to 10^{-9} m/s.

McNally (2004) describes general characteristics of aquitards, such as the Wianamatta Group, as comprising:

- *Low, but variable, hydraulic conductivity….., very limited storage and low well yield – typically less than 1 L/s or 0.1 ML/day.*
- *The water-bearing fractures are impersistent, widely spaced and, in particular, poorly interconnected. These 'aquifers' can therefore be visualised as a complex of stacked and sporadically distributed ephemeral perched water tables rather than a single saturated zone, and it is questionable whether a continuous water table can be said to exist.*
- *Boreholes and piezometers may appear to be dry when first drilled, yet slowly fill with water over several weeks. Piezometer recovery time following bailing is very slow and SWLs [standing water levels] may fluctuate by a number of metres over many months (and up to 9 m over three drought years).*
- *SWLs in piezometers 100-200 m apart may differ by 1- 3 m on the same day and seasonal variations of 3- 4 m are possible. Nearby wells may differ greatly in salinity, say 7,000 to 21,000 mg/L within 50 m (and can also demonstrate large seasonal changes).*

McNally (2004) described the shallow regolith aquitard as being *made up of residual soil, colluvium, floodplain alluvium and weathered saprolite – all clays derived from the shale bedrock. It also includes, in places, lateritic mottled zones and ferricrete where these are developed on a shale parent rock. The regolith ranges in thickness from less than one metre on hill crests to 6-12 m on valley floors. The constituent deposits are largely very stiff to hard silty clays with varying proportions of shale fragments, pisolithic ironstone gravel, mottling and limonite staining, and are difficult to distinguish in boreholes. Colluvium merges into alluvium through downslope creep, and residual soils may develop either directly on the parent shale or on the colluvium/alluvium derived from it.*

The best aquifer in the region of the site is expected to be within the Hawkesbury Sandstone. This comprises a typically horizontally bedded sandstone formation, with variable hydraulic conductivity, which hosts a generally confined fractured rock aquifer. The majority of groundwater within the Hawkesbury Sandstone migrates through features such as fractures, joints, shears and bedding planes, however some intra-granular flow also occurs.

3.4.3 Groundwater Quality

Groundwater quality in the Wianamatta Group is general saline, with McNally (2004) reporting typical salinity values in the range 5,000-50,000 mg/L. Groundwater quality in the Bringelly Shale is typically not suitable for beneficial use for human or stock consumption or for irrigation.

Groundwater in the Hawkesbury Sandstone often has naturally elevated concentrations of iron and manganese, and is generally acidic with a pH varying between 4.5 and 6.5. Salinity levels are low, although the salinity of the upper part of the aquifer may be elevated due to flows from the overlying shales.

3.4.4 Water Sharing Plan

The site is located in the area subject to the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* (the WSP). The site is located within the Sydney Basin Central groundwater source covered by the WSP.

The WSP is informed by the NSW Office of Water (NOW) *Water Sharing Plan Greater Metropolitan Region Groundwater Sources Background document* (2011) (NOW, 2011).

NOW (2011) described the Sydney Basin Central groundwater source as a porous rock aquifer with low to moderate connectivity to surface waters and an estimated "travel time between groundwater and unregulated river" of years to decades.

The *Rules summary sheet for the Sydney Basin Central Groundwater Source (*July 2011) Rules for granting and amending water supply works approvals, includes "*To protect water quality: To minimise the impact on water quality from saline interception in the shale aquifers overlying Sydney basin sandstone, the bore being used to take groundwater must be constructed with pressure cement to seal off the shale aquifer as specified by the Minister*."

3.4.5 Groundwater Aquifer Conditions and Pressures

The Department of Environment, Climate Change and Water (DECCW) *State of the Catchments 2010: Sydney Metropolitan region: Groundwater* (2010) (DECCW, 2010) assigns the Sydney Basin–Central aquifer as poor to very poor for all indicators, including groundwater levels, quality and groundwater dependent ecosystems (GDE) condition, with an overall condition assessment of poor.

DECCW (2010) also assesses the "pressures" from potential impacts from human activity. The pressures on the Sydney Basin–Central aquifer have been assessed as ranging from very low to very high, with an overall pressure assessment of moderate. Assessments of very low and low were assigned for extraction rates and regional impacts; an assessment of moderate was made for localised impacts and groundwater quality impacts; and assessments of very high to high were made for GDE availability, land-use pressures and aquifer structure pressures.

DECCW (2010) identified the main pressure in the Sydney Basin–Central groundwater management area as being mining, with existing mining activities causing dewatering of the aquifer and permanent alteration of the aquifer matrix.

3.4.6 Groundwater Vulnerability

Groundwater vulnerability is defined in the Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council (ANZECC) *Guidelines for Groundwater Protection in Australia*, September 1995 (ANZECC, 1995) as a relative evaluation of the potential exposure of a groundwater resource and its beneficial use to contamination from planned and unplanned sources. The concept of vulnerability is based upon an assumption that the physical environment can provide some degree of protection from contamination through natural attenuation processes. The vulnerability assessment is a qualitative assessment based upon the hydrogeological regime, as well as the thickness and nature of the unsaturated zone overlying the aquifer. For example, a shallow unconfined aquifer with a permeable unsaturated zone would be highly vulnerable to surface contamination, whereas a deep confined aquifer would have a low vulnerability.

The groundwater resource most likely to be present beneath the site comprises a confined sandstone aquifer at depths of greater than 100 m (based on registered bore GW109317, refer to Section 3.4.1) overlain by the relatively low permeability aquitards of the Wianamatta Group. Whilst groundwater bearing zones may be present within fractures in the Wianamatta Group, the potential for significant impact on these is also considered to be limited by overlying low permeability horizons. On this basis the aquifer vulnerability in the area of the site is considered to be low.

3.4.7 Beneficial Groundwater Use

Based on above information it is considered that groundwater within the Wianamatta Shales in the region of the site is not subject to, or suitable for, beneficial use.

Registered bore GW109317 (refer to Section 3.4.1) recorded salinity in the Hawkesbury Sandstone at depths of 127 m and 164 m bgl in the region of the site of 10,000 mg/L, although this may have been impacted by leakage within the bore. The lack of production bores registered in the area indicates that water in Hawkesbury Sandstone in the region of the site is not subject to beneficial use, and may not be suitable for beneficial use without treatment.

3.5 Groundwater Dependent Ecosystems

NOW (2011) identifies high priority groundwater dependent ecosystems (GDE), and a drawing of the locations is provided as Figure 4, below. The nearest down-hydraulic gradient mapped GDE is over 10 km from the site.

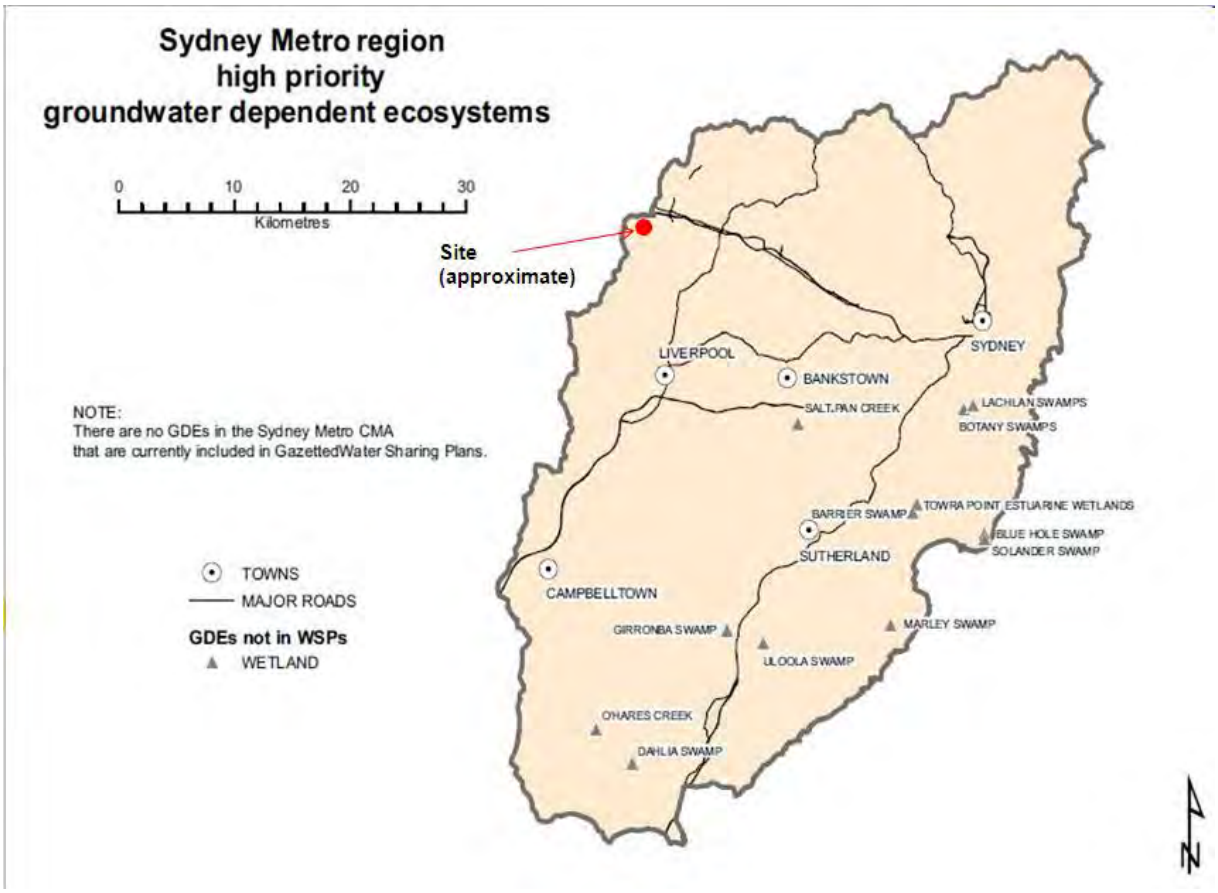

Figure 4: Sydney Metro Region High Priority GDE (from State of the Catchments, Groundwater Sydney Metropolitan region, 2010)

3.6 Fairfield LEP 2013

The pertinent information summarised below was obtained from the Fairfield Local Environmental Plan 2013 (the LEP) and associated mapping.

3.6.1 Zoning

The site, and the land to approximately 1 km down-gradient of the site, is zoned IN1 General Industrial. The objectives of the zone are:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To ensure development is not likely to detrimentally affect the viability of any nearby business centre.

3.6.2 Terrestrial Biodiversity

Clause 6.5 of the LEP covers terrestrial biodiversity, and includes the following:

(1) The objective of this clause is to maintain terrestrial biodiversity by:

(a) protecting native fauna and flora, and

(b) protecting the ecological processes necessary for their continued existence, and

(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

(2) This clause applies to land identified as "Biodiversity" on the *Terrestrial Biodiversity Map*.

The mapping shows that the closest area of mapped as "Biodiversity" is approximately 750 m cross gradient from the site. The closest down-gradient "Biodiversity" is over 1 km away, on the other side of the unnamed tributary of Prospect Creek.

3.6.3 Riparian land and watercourses

Clause 6.6 of the LEP covers Riparian land and watercourses, and includes the following:

(1) The objective of this clause is to protect and maintain the following:

(a) water quality within watercourses,

(b) the stability of the bed and banks of watercourses,

(c) aquatic and riparian habitats,

(d) ecological processes within watercourses and riparian areas.

(2) This clause applies to land identified as "Riparian area" on the *Riparian Lands and Watercourses Map*.

(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:

(a) whether or not the development is likely to have any adverse impact on the following:

(i) the water quality and flows within the watercourse,

(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,

(iii) the stability of the bed and banks of the watercourse,

(iv) the free passage of fish and other aquatic organisms within or along the watercourse,

(v) any future rehabilitation of the watercourse and riparian areas, and

(b) whether or not the development is likely to increase water extraction from the watercourse, and

(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided-the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised-the development will be managed to mitigate that impact.

The unnamed tributary of Prospect Creek is located approximately 400 m south and south east of the site, and is likely to be the receiver of surface water runoff from the site. The watercourse is mapped as "Riparian area" under the LEP.

4. Previous Reports

4.1 Previous Reports

The following previous reports were available for review:

- Dames and Moore, *Mobil Site Audit Assessment Form*, 1990 [only pages 1 and 2 and a sketch available for review]((D&M, 1990);
- URS, *Phase 1 Environmental Site Assessment - Emoleum Wetherill Park Facility, 24 Davis Road, Wetherill Park, New South Wales (fieldwork – June 2004)* [only executive summary available for review](URS, 2004);
- URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW,* 2006 (reference 42423822) (URS, 2006);
- URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2010 (reference 42424135) (URS, 2010);
- URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424436) (URS, 2012b);
- URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c);
- URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2012 (reference 42424436), 2012 (URS, 2012d);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424444) (URS, 2012e);
- URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01),* 2013 (reference 42424443), 2013 (URS, 2013a);
- URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW (reference 4242443),* 2013 (URS, 2013b);
- URS *Environmental Summary Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW*, 2 May 2013 (reference 42424443) (URS, 2013c); and
- DP *Review of Contamination Reports Proposed Resource Recovery & Recycling Centre 24 Davis Road, Wetherill Park, NSW* (Project 85126.00, dated 19 October 2015)(DP, 2015).

Information from the above reports is provided below and in relevant sections of this report, with selected extracts provided in Appendix C.

4.2 Overview of Previous Contamination Works

DP (2015) reviewed the above documents in conjunction with a site inspection, and made the following summary regarding the contamination issues at the site:

- *"URS have conducted detailed soil investigations of the site, particularly given that soil sampling has been conducted from more than 60 test bores and the minimum sampling density is 30 locations for a 2 ha site according to the NSW EPA Sampling Design Guidelines, 1995. However, soil sample analysis was generally limited to potential contaminants associated with fuel/chemical storage and asphalt manufacturing and not for other potential contaminants such as pesticides and asbestos.*
- *Soil beneath the workshop and laboratory buildings has not been investigated. Soil behind the laboratory (where an asphalt stockpile was observed) has not been investigated;*
- *Soil down-gradient (south) of the existing interceptor pit at the eastern site boundary was not assessed;*
- *Potential soil contamination from the former substation at the west of the site (next to former main manufacturing area) and the current substation between the buildings at the east of the site have not been investigated (for PCB impacts);*
- *Hydrocarbon impacted soil (predominantly impacted with TPH C10-C36) remains in situ at the former manufacturing area. Although URS concluded that no further excavation (chase-out) of TPH C10-C36 impacted soil was required during remediation works and the 95% UCL for contaminants of concern were within the adopted assessment criteria, it is not clearly stated that the contamination identified at test bores SB118, SB121 and SB122 did not need to be addressed further. Also it is unknown if the contamination identified by Dames & Moore (1990) near the workshop is significant;*
- *Similar to above, it is not clearly stated that the contamination identified at test bore SB104, near excavation EX03, did not need to be further addressed.*
- *It is unknown if the contamination identified by Dames & Moore (1990) at the previous solvent wash area (at the middle level) is significant. Results for test bore SB22 (URS, 2006) suggest that it is not significant.*
- *Given that groundwater was monitored from 13 wells spread across the site in three separate events, it is considered that groundwater has been subject to detailed assessment by URS. It is noted that OCP was not tested, although considered to be a potential contaminant of concern in URS, 2004.*
- *Based on data from all groundwater monitoring events, even though some groundwater impacts were detected, it is considered that significant groundwater contamination was not identified (prior to remediation works). Removal of contaminated soil as a result of remediation works may have resulted in improved groundwater quality across the site.*

It is important to note that NSW EPA, 1994 and NEPC, 1999 which were used by URS to source assessment criteria were superseded in April 2014 and May 2013 respectively. The primary guidance for the assessment of contaminated sites is currently:

- *National Environmental Protection Council (NEPC), National Environmental Protection (Assessment of Site Contamination) Measure, 1999 amended 2013 (NEPC, 2013).*

With regard to this change in guidance:

- *Soil Health Investigation Levels (HIL) for metals, PAH and phenols for commercial and industrial sites are generally less conservative in NEPC, 2013 than in NEPC, 1999;*
- *Soil ecological criteria for industrial and commercial sites are presented in NEPC, 2013 for arsenic, copper, chromium, lead, nickel, zinc, DDT, TPH, BTEX, naphthalene and benzo(a)pyrene. It is, however, noted that much of the proposed use of the site will be covered in hardstand and areas of ecological value may be limited to the peripheries of the site (landscape areas);*
- *The primary health-based Screening Levels (HSLs) for TRH, BTEX and naphthalene in soil are based on the potential risk of exposure via the vapour intrusion pathway; and*
- *Management limits are presented in NEPC, 2013 for TPH in soil which take into account the nature and properties of petroleum hydrocarbons, such as the formation of observable light non-aqueous phase liquids, fire and explosive hazards and effects on buried infrastructure.*
- *The TPH assessment criteria in NEPC, 2013 are based on TPH fractions that are different to those presented in NSW EPA, 1994."*

4.3 Summary of Previous Groundwater Assessments

The following groundwater works were undertaken at the site by URS:

- 2006: Construction of 13 groundwater monitoring wells (MW01-MW13), sampling and analysis from the 13 wells (URS, 2006);

Then, following decommissioning of the site

- 2008: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2010);
- 2010: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2012a);
- 2012: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2012e); and
- 2013: decommissioning of the 13 groundwater monitoring wells by filling with grout (bentonite and cement mix) (URS, 2013a).

Appendix C provides extracts of the URS reports, including drawings with conceptual site models, groundwater contours, and groundwater contamination; monitoring well borehole logs and field parameters, including groundwater levels, for the various rounds of groundwater monitoring.

The following pertinent information was provided:

- Groundwater flow was inferred to be in a south-easterly direction toward an unnamed tributary of Prospect Creek (URS, 2006);
- Groundwater was generally encountered within the shale bedrock, although perched groundwater was encountered in filling or at the top of the natural soil in several bores (URS, 2012e);
- The investigation levels used by URS were sourced from NSW EPA, 1994; ANZECC and ARMCANZ, 2000; and National Health and Medical Research Council and National Resource Management Ministerial Council, National Water Quality Management Strategy, Australian Drinking Water Guidelines, 2004 (NHMRC, 2004).

- Various on-site contamination sources were identified in URS (2006) related to the use of the site as an asphalt batching plant. These included above ground storage tanks (bitumen, diesel, kerosene, waste oil); underground storage tanks (fuel, diesel, kerosene); triple/oil interceptors;
- Off-site sources of contamination were identified to comprise oils, fuels and solvents potentially being stored on the metal recycling depot located adjacent the western boundary (across gradient) and oils / fuels potentially being stored on the industrial units located to the east (across gradient). (URS, 2006);
- The analytes included BTEX, PAH, phenols, metals, VCH total organic carbon (TOC), dissolved methane, nitrate, sulphate, ferrous iron and ferric iron for at least one round;
- Phased separated hydrocarbons were not reported in any well over the monitoring events (URS, 2006, 2010, 2012a, 2012e);
- URS considered that as groundwater was not impacted by contaminants of potential concern in the final GME above the assessment criteria with the exception of metals, risks to human health and the environment were low and acceptable. Due to the widespread nature of the detections it was considered by URS that the detections of heavy metals in the groundwater beneath the site were indicative of local groundwater quality (URS, 2013c); and
- It is noted that elevated levels of PAH and TPH C10-C36 were detected in some monitoring events (although not in the final event).

Table 4: URS (2013) Summary of Site-Specific Hydrogeology

Parameter	Description
Groundwater Occurrence	Groundwater was generally encountered within the shale bedrock aquifer across the site. Perched water was encountered in the fill material/ top of natural ground in boreholes SB101 (0.3-0.5mbgl), SB103 (0 to 0.25 mbgl), SB107 (0.2-0.3 mbgl), SB108 (0.1-0.2 mbgl), SB120 (0.3-0.4 mbgl), SB 121 (0.15-1.5 mbgl) SB122 (0-0.2 mbgl) and SB125 (0.3-1.8 mbgl). The perched water appears to be contained within the fill material which overlays natural potentially low permeability clay. SWLs gauged in groundwater wells across the site varied between 0.15 and 3.07 m below top of casing (btoc)
Groundwater Elevation and Flow Direction	Groundwater elevations across the entire site varied between 33.71 (MW01) and 44.25 m AHD (MW13). The inferred direction of groundwater in the groundwater aquifer is in a southerly direction towards the unnamed tributary of Prospect Creek.

Parameter	Description
Hydraulic Conductivity	Based on literature values for the type of lithology encountered beneath the site (shale/ siltstone), the hydraulic conductivity of the aquifer is estimated to be in the order of 1.5E-6 m/year to 3.1E-2 m/ year (Freeze and Cherry, 1979).
Groundwater Velocity	Assuming an effective porosity of 1 to 33% (Freeze and Cherry, 1979) typical for the shale, the groundwater velocity beneath the site is estimated to be in the order of approximately 4.3×10^{-8} to 5.23×10^{-1} m/year
Beneficial Groundwater Use	Groundwater salinity, as calculated from electrical conductivity (EC) readings varies from 700 to 21,344 mg/L total dissolved solids (TDS) indicating fresh to saline water. It is noticeable that TDS readings in MW13, MW08 and MW09 are less than 1,000 mg/L indicting a possible fresher water source. During site visits, surface water pooling was also noted within the gravel cover on the grounds surface in the vicinity of MW08.
Field Parameter Measurement	Ex-situ measurement of dissolved oxygen (DO), oxidation/ reduction potential (redox), pH, EC and temperature is summarised below. DO varied from 0.4 parts per million (ppm)(MW12) to 7.37 (MW11) ppm, indicating poorly to well oxygenated water. Redox Potential results ranged from 172 mV (MW08) to 2.37 (MW04) mV indicating moderately oxidising conditions. Groundwater temperatures ranged from 18.8°C to 23.4°C.

5. Site Walkover

5.1 Site Description and Walkover

The development area is rectangular in shape and slopes moderately steeply from the northern boundary down to Davis Road on the southern boundary. The site covers an area of approximately 20,292 m^2. Site photographs are provided in Appendix D.

The following infrastructure is present on the site:

- A workshop, laboratory, storeroom and amenities buildings and substation located towards the eastern boundaries of the site;

- Concrete stockpile bays in the middle level of the site - in the centre and on the eastern boundary;
- In-ground recycled water tanks in the south of the site adjacent to the office building;
- A remnant shelter on the higher level towards the eastern boundary;
- Batter slopes and retaining walls between higher middle and lower levels of the site;
- An oil separator pit on the middle level on the eastern boundary of the site;
- The majority of the site is sealed with asphalt except for some areas on the upper and lower levels where remediation works have occurred.

An inspection of the site and surrounds was conducted by DP on 2 February 2016.

The site had three main levelled areas, consistent with previous levelling and contouring for site development, comprising and upper, middle and lower levelled area. An internal roadway on the western side of the site connected the levels.

No evidence of bedrock outcrops, springs or seepages was noted within the site.

A scrap metal landuse was noted to the west (cross-gradient) of the site, with activities appearing to include crushing of cars.

5.2 Surrounding Water Bodies

Prospect Creek and its unnamed tributary in the vicinity of the site were inspected at the time of the site visit.

The tributary, where it crossed Elizabeth Street, was observed to be a concrete lined canal estimated to be in the order of 3 m deep. A small volume of water was flowing at the time of the site visit (refer to Photograph 7, Appendix D).

Prospect Creek, where it crossed Reconciliation Drive, was observed to be approximately 1 m wide and flowing, with reeds and vegetation around it on a floodplain (refer to Photograph 8, Appendix D).

Prospect Reservoir, to the north (up-gradient) of the site, was not inspected.

It is considered unlikely that groundwater from the site is contributing significantly to the observed surface water bodies.

6. Summary Hydrogeology

Based on the regional information and previous reports discussed above, the following hydrogeological conditions are expected at the site:

- The upper geological profile, comprising the Wianamatta Group, is in effect an aquitard, and may be in the order of 100 m or more in thickness in the area of the site;

- Water in the upper horizons of the Hawkesbury Sandstone, beneath the Wianamatta Group, in the region of the site may be impacted by salinity from the overlying shale;
- A water bearing zone exists in the upper weathered horizon of the Bringelly Shale of the Wianamatta Group, with standing water levels between 0.15 and 3.07 m btoc (URS, 2013) in boreholes drilled to depths of 5.5 m to 10.2 m bgl, (noting the wells were finished with Gatic covers at the ground surface). Water observations during drilling mainly indicated that the substrate appeared to be predominantly dry during drilling, with the exception of two locations where wet soils were observed at approximately 4 m bgl;
- Published typical bulk hydraulic conductivity for the weathered Bringelly Shale are in the order of 10^{-6} to 10^{-9} m/s;
- Electrical conductivity readings by URS showed considerable variability over the site, consistent with the formation having limited hydraulic connectivity. Some of the readings were too saline for most possible beneficial uses.
- Petroleum-based contamination previously detected in groundwater at the site was not recorded as being spatially or temporally persistent, with all results less that the laboratory limits of reporting in the last monitoring round;
- Elevated levels of metals previously detected in groundwater at the site were considered by URS to most likely be attributable to background water quality; and
- The DPI registered bores indicate that groundwater is not being used within at least one kilometre of the site.

7. Proposed Development and Potential for Contamination

Plans of the current and proposed site layouts are provided in Appendix A.

The proposed development is for a resource recovery facility. The below information on the proposed development has been sourced from the RPS Group *Greenspot Resource Recovery Centre State Significant Development Preliminary Environmental Assessment Lot 18 DP 249417 24 Davis Road, Wetherill Park, NSW* (PR127695; November 2015).

The Resource Recovery Facility is proposed to process up to 200,000 tonnes/ year of materials which would benefit those Councils, businesses and industries requiring an alternative to waste disposal through the recovery and beneficial use of valuable resources. The recovered resources would be transferred either directly to end markets or to other facilities or processors for value adding to achieve maximum value for the beneficial use. The facility is also proposed to act as a distribution centre for recycled materials and for the distribution and marketing of bulk landscape supplies including barks, sands and aggregates.

It is proposed to primarily accept the following waste streams at the facility:

- Hydro-excavation and drill muds/fluids for consolidation and removal from site for use as structural fill or as a feedstock within a soil conditioner and compost manufacturing;
- Bulk landscaping supplies for distribution into the surrounding areas; and
- Garden organics, commingled food and garden organics and food waste.

Detailed below are the approximate amounts of waste for each stream to be received at the site:

- 60,000 tonnes of hydro-excavation and drill mud/fluids per annum (pa);
- 40,000 tonnes of bulk landscaping supplies pa; and
- 100,000 tonnes of garden organics, commingled food and garden organics and food waste pa.

The recycling activities associated with the proposed development are briefly described as follows:

- **Separation and Consolidation of Hydro-Excavation, Drill Muds and Fluids**
  Hydro-excavation and drill muds/fluids will enter the site via a weighbridge whereby the consignment will be checked. Hydro-excavation and drill muds/fluids will be unloaded in purpose built receival and settling bays (mid-level) to allow for the separation of liquids and solids. Liquids will be drained by gravity to a designated 60,000 litre storage tank which will have the capacity to agitate the liquid to minimise the settling of any silt and clay within the storage tank. The solids will either be transferred to end use site as engineered fill in accordance with the respective EPA resource recovery order or be blended with other organics and recycled materials to produce a range of landscaping products.
- **Bulk Landscaping Supplies**
  Bulk loads of landscaping materials are proposed to be bought to the site from regional areas of NSW for storage and redistribution into the Sydney landscape market. Some materials may also be used in the preparation of purpose designed blended products again to be used in the landscaping industry or in soil rejuvenation projects. Types of landscaping materials to be received and stored onsite include soil, compost, sands, barks and aggregates. Existing purpose built bays (mid-level) will be used and others will be constructed whereby raw materials will be unloaded, stored, possibly blended and then loaded out for distribution to various end use applications.
- **Sorting and Consolidation of Garden Organics and Food Waste**
  Garden organics, commingled garden and food organics, and food waste are proposed to be received for sorting, decontamination shredding and consolidation prior to being transported off site to Bettergrow owned and operated composting facilities for further processing and conversion to valuable soil enhancement products. Unloading will occur within an enclosed, purpose built building (upper level) with an approximate floor area of 2,200 m^2. The building will be designed with appropriate ventilation systems and odour control features to minimise odour release and provide a safe and healthy work environment for staff and neighbouring industries.

Existing onsite infrastructure will be utilised where possible for the development, including site office, workshop, shedding, staff amenities, raw material bays, roading and car parks, and stormwater management structures. Improvements and/or repairs will be undertaken of the above infrastructure items where required.

New site infrastructure will be constructed to accommodate the proposed activities, including buildings for the sorting of food, garden, and organic wastes, hydro-excavation and drill mud settling bays, storage and settling tanks, weigh bridge, and gross pollutant trap.

The proposed Food Depackaging and Process Building (refer to Style Developments Pty Ltd drawings on Sheets C01 and C03 in Appendix A) includes a tipping pit for receipt of food for recycling. The proposed dimensions of the pit are 12 m by 6 m, by 3 m deep (44 m AHD)(to the top of the base slab).

Allowing for a concrete slab and subgrade, additional excavation in the order of 0.5 to 1 m is expected (i.e. a potential total excavation level to 43 m AHD). It is understood that it is proposed that the pit will include an impermeable barrier to prevent leakage of leachate into the surrounding ground.

8. Comments

8.1 Potential Groundwater Impacts

The current site gradient and significant area of hardstand/ compacted soils will limit infiltration over much of the site in its current condition. Where possible the proposed development will use the current site infrastructure, minimising changes to infiltration at the site. Soft landscaping areas, with the highest potential for infiltration, are proposed to be retained.

The majority of materials imported onto the site are expected to be solids which have a negligible potential to impact on groundwater.

An enclosed building will be constructed for handling of food, garden, and organic wastes, minimising the potential for runoff from these materials entering the groundwater. No composting is proposed to be undertaken at the site.

The proposed tipping pit in the Food Depackaging and Process Building is located in the vicinity of previous boreholes URS MW10 and MW11. Four groundwater level readings were recorded by URS between 2005 and 2012, with groundwater levels in these two wells being recorded between 41.42 m and 43.97 m AHD. The base of the proposed excavation (including for subgrade preparation) is in the order of 43 m AHD, which is below the highest groundwater level recorded by URS in the two wells located closest to the pit. A pit to this depth would need to be of suitable design to penetrate the groundwater table, either by tanking or an appropriate drainage system (if approved by the NSW Department of Primary Industries Office of Water (NOW)).

The pit is proposed to be lined with an impermeable barrier to prevent leakage of leachate into the surrounding ground.

Purpose built settling bays, storage and settling tanks will be constructed for the hydro-excavation and drill muds/fluids, limiting the potential for these materials to enter groundwater at the site. These materials are generally considered to have a low risk of containing significant quantities of contamination.

The proposed development is considered to have negligible potential for significant interference with groundwater; involves only minor changes to the potential for infiltration at the site; and has a relatively low risk of discharging potential contaminants.

The hydrogeological review indicates that it is unlikely that any significant groundwater resource is located in the upper 100 m of the subsurface profile. The Hawkesbury Sandstone aquifer vulnerability is considered to be low due to its depth, and the low permeability and connectivity of water in the Wianamatta Group which is exposed at the site.

8.2 Conclusions

Overall, it is considered that the proposed development poses a low risk of significantly impacting groundwater supply or quality. Specifically:

- **Beneficial Groundwater Use**
  Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site.

  Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and DPI registered bores do not show any current beneficial use in the area of the site.

  The proposed development is considered to have a negligible risk of impacting the quality or supply of groundwater at the site.

- **Groundwater Dependent Ecosystems**
  There are no high priority GDE within or near the site. The proposed development is not considered to present a potential risk to GDE.

- **Impacts on Bores and Natural Drainage Features**
  The proposed development is not considered to present a potential risk to bores or natural drainage features.

8.3 Contingency Measures and Recommendations

As with any activity, appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required, and will mitigate further the already low risk posed by the development on groundwater at the site.

Areas where liquid wastes or dangerous goods are to be handled should have appropriate containment measures to prevent leachate/ spillage from entering the ground. This will include, as a minimum, the proposed tipping pit in the Food Depackaging and Process Building. Containment measures should include an impermeable liner (e.g. HDPE or a compacted clay layer), bunding and spillage/ overflow contingency measures.

Furthermore, the currently proposed excavation level for the tipping pit (in the order of 43 m AHD) will require appropriate design in consideration of it extending below the measured water table in the two previous wells located closest to the proposed pit. This may trigger the NSW Aquifer Interference Policy, administered by NOW. This design could include tanking or an appropriately drained system (if approved by NOW). Alternately the pit could be redesigned to reduce potential interaction with groundwater as discussed below.

If the pit is to be redesigned to reduce the potential for interference with groundwater, it is recommended that the excavation level (i.e. to the base of the sub-grade) be no lower than 44.5 m AHD, i.e. at least 0.5 m above the highest recorded groundwater level in the two former wells located closest to the pit. It is considered that this would result in minimal interference of the pit with groundwater during normal conditions, although groundwater could potentially rise to the level of the pit during high rainfall events. As such an appropriate pressure relief system/ valve would need to be

installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events. The pressure relief system would need to be designed to minimise the potential for leakage of leachate through the impermeable lining. Any water ingressing through this system would need to be managed and disposed of as potentially contaminated leachate.

If groundwater is encountered during construction of foundations for any of the proposed new structures it is expected to comprise water in the Bringelly Shale aquitard. The water would be expected to be of limited quantity, connectivity and of low quality with respect to potential for beneficial use. Standard construction and water management/ disposal methods are considered suitable for any water encountered under this scenario.

It is considered appropriate to construct monitoring wells into the upper weathered shale profile to obtain background groundwater quality for comparison purposes in the future. Monitoring at 6 monthly intervals over a period of two years would provide a good background dataset for the proposed development. If the monitoring identified significant variation in the groundwater quality, further monitoring should be undertaken to provide a better understanding of the background conditions and variability.

If a potentially contaminating substance is to be stored or used on the site in the future, further groundwater monitoring should be undertaken, if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater.

In the event of a leakage or spillage of leachate or other potentially contaminating liquid, assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and/ or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds.

9. References

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2. Dames and Moore, *Mobil Site Audit Assessment Form*, 1990 [only pages 1 and 2 and a sketch available for review]((D&M, 1990)
3. DP *Review of Contamination Reports Proposed Resource Recovery & Recycling Centre 24 Davis Road, Wetherill Park, NSW* (Project 85126.00, dated 19 October 2015)(DP, 2015)
4. Fairfield Local Environmental Plan 2013
5. Geoscience Australia *Australian Stratigraphic Units Database*, accessed 18 March 2016. http://dbforms.ga.gov.au/pls/www/geodx.strat_units.int
6. Herbert, C & Smith, V, Penrith 1:100,000 Geology Sheet Edition 1, 1991
7. McNally, G 2004, 'Shale, Salinity And Groundwater In Western Sydney', *Australian Geomechanics* Vol 39 No 3, September 2004 pp107-122
8. NSW Department of Environment, Climate Change and Water (DECCW) *State of the Catchments 2010: Sydney Metropolitan region: Groundwater* (2010) (DECCW, 2010)

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10. NSW Office of Water (NOW) *Water Sharing Plan Greater Metropolitan Region Groundwater Sources Background document* (2011) (NOW, 2011)

11. Lovering, J. F., 1954. The stratigraphy of the Wianamatta Group Triassic System, Sydney Basin. *Records of the Australian Museum* 23(4): 169–210, plate xii. [25 June 1954]

12. RPS Group *Greenspot Resource Recovery Centre State Significant Development Preliminary Environmental Assessment Lot 18 DP 249417 24 Davis Road, Wetherill Park, NSW*, 2015 (reference PR127695)

13. *Rules summary sheet for the Sydney Basin Central Groundwater Source (*July 2011)

14. URS, *Phase 1 Environmental Site Assessment - Emoleum Wetherill Park Facility, 24 Davis Road, Wetherill Park, New South Wales (fieldwork – June 2004)* [only executive summary available for review](URS, 2004)

15. URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW,* 2006 (reference 42423822) (URS, 2006)

16. URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2010 (reference 42424135) (URS, 2010)

17. URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a)

18. URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424436) (URS, 2012b)

19. URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c)

20. URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2012 (reference 42424436), 2012 (URS, 2012d)

21. URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424444) (URS, 2012e)

22. URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01),* 2013 (reference 42424443), 2013 (URS, 2013a)

23. URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW (reference 4242443),* 2013 (URS, 2013b)

24. URS *Environmental Summary Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW*, 2 May 2013 (reference 42424443) (URS, 2013c)

25. *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011*

26. NSW Department of Primary Industries Office of Water *NSW Aquifer Interference Policy*, 2012

10. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at 24 Davis Road, Wetherill Park in accordance with DP's proposal SYD151689 Rev1 dated 19 January 2016 and acceptance received from Mr Neil Schembri dated 22 January 2016. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Bettergrow Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied

upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after field testing has been completed.

DP's advice is based upon the information reviewed as discussed herein, including conditions encountered during the reviewed investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

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

Douglas Partners Pty Ltd

Appendix A

About This Report

Site Drawings

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

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

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

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

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

IMPORTANT NOTE: DETAIL SURVEY

1. THIS PLAN WAS PREPARED FOR THE SOLE PURPOSES OF THE CLIENT FOR THE SPECIFIC PURPOSE OF PRODUCING A DETAIL PLAN. THIS PLAN IS STRICTLY LIMITED TO THE PURPOSE AND DOES NOT APPLY DIRECTLY OR INDIRECTLY AND WILL NOT BE USED FOR ANY OTHER APPLICATION, PURPOSE, USE OR MATTER. THE PLAN IS PRESENTED WITHOUT THE ASSUMPTION OF A DUTY OF CARE TO ANY OTHER PERSON (OTHER THAN THE CLIENT) ("THIRD PARTY") AND MAY NOT BE RELIED ON BY THIRD PARTY.

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G. THE ACCURACY, RELIABILITY, SUITABILITY OR COMPLETENESS OF ANY APPROXIMATIONS OR ESTIMATES MADE OR REFERRED TO BY RPS AUSTRALIA EAST PTY LTD IN THIS PLAN.

3. WITHOUT LIMITING PARAGRAPH 1 OR 2 ABOVE, THIS PLAN MAY NOT BE COPIED, DISTRIBUTED, OR REPRODUCED BY ANY PROCESS UNLESS THIS NOTE IS CLEARLY DISPLAYED ON THE PLAN.

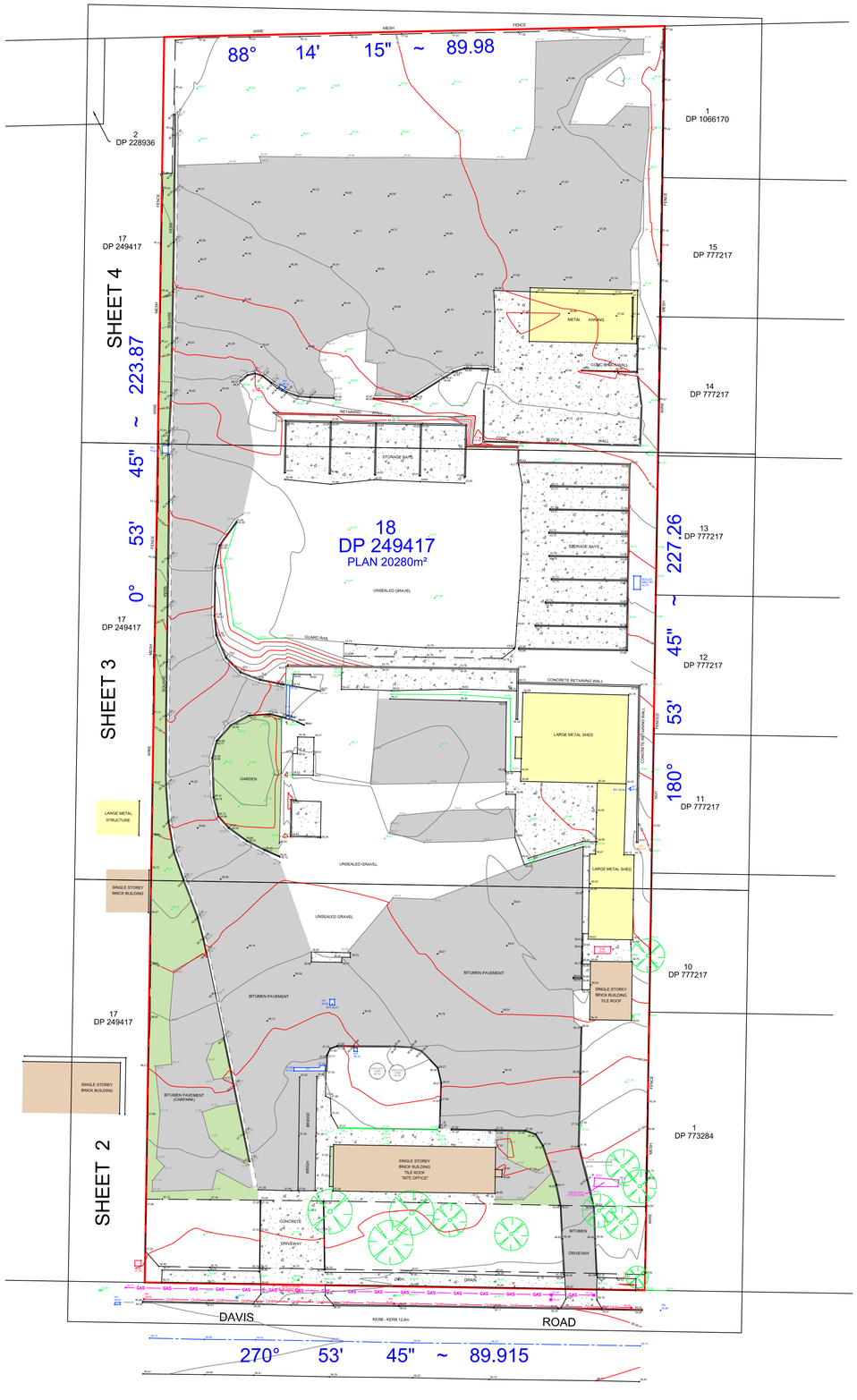
4. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY AND NOT BY FIELD SURVEY. IF NOT ABLE TO BE SO LOCATED, SERVICES HAVE BEEN PLOTTED FROM THE RECORDS OF RELEVANT AUTHORITIES WHERE AVAILABLE AND HAVE BEEN NOTED ACCORDINGLY ON THIS PLAN. WHERE SUCH RECORDS EITHER DO NOT EXIST OR ARE INADEQUATE A NOTATION HAS BEEN MADE HEREON.

5. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

6. ONLY VISABLE PITS WERE LOCATED AND THOSE THAT DO NOT SHOW INVERTS WERE DEEMED INACCESSIBLE.

LEGEND

- BOUNDARY
- ADJOINING BOUNDARY
- FENCE
- GAS
- OVERHEAD POWER
- TELSTRA PIT
- HYDRANT
- TREE
- GAS MARKER
- BUILDING HATCH
- MISC HATCH
- CONCRETE HATCH
- ROAD HATCH
- GARDEN HATCH



MGA

DIAL 1100 BEFORE YOU DIG

TITLE:	PLAN SHOWING DETAIL SURVEY LOT 18 DP 249417
LOCATION:	24 DAVIS ROAD WETHERILL PARK
DATUM: / PROJECTION:	AHD (GPS SSM75574) MGA (DP1066170)
DATE: / PURPOSE:	14-10-2015 DETAIL
AUTOCAD REF: / VERSION (PLAN BY):	127695-151014-DETAIL 3 (8-3-2016)
CLIENT:	BETTER GROW
JOB REF:	PR127695-4

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

ODOUR SCRUBBER TOWERS

WATER STORAGE TANKS

HOOKLIFT TRUCK

ORGANICS BUILDING REFER SHEETS B01–B04

OFFICE LOCATION 18.8m X 6m REFER SHEET D01

REVERSING AND EXIT TRUCK AND TRAILER ASSUMED 19m LONG

FOOD DEPACKAGING BUILDING REFER SHEETS C01–C03

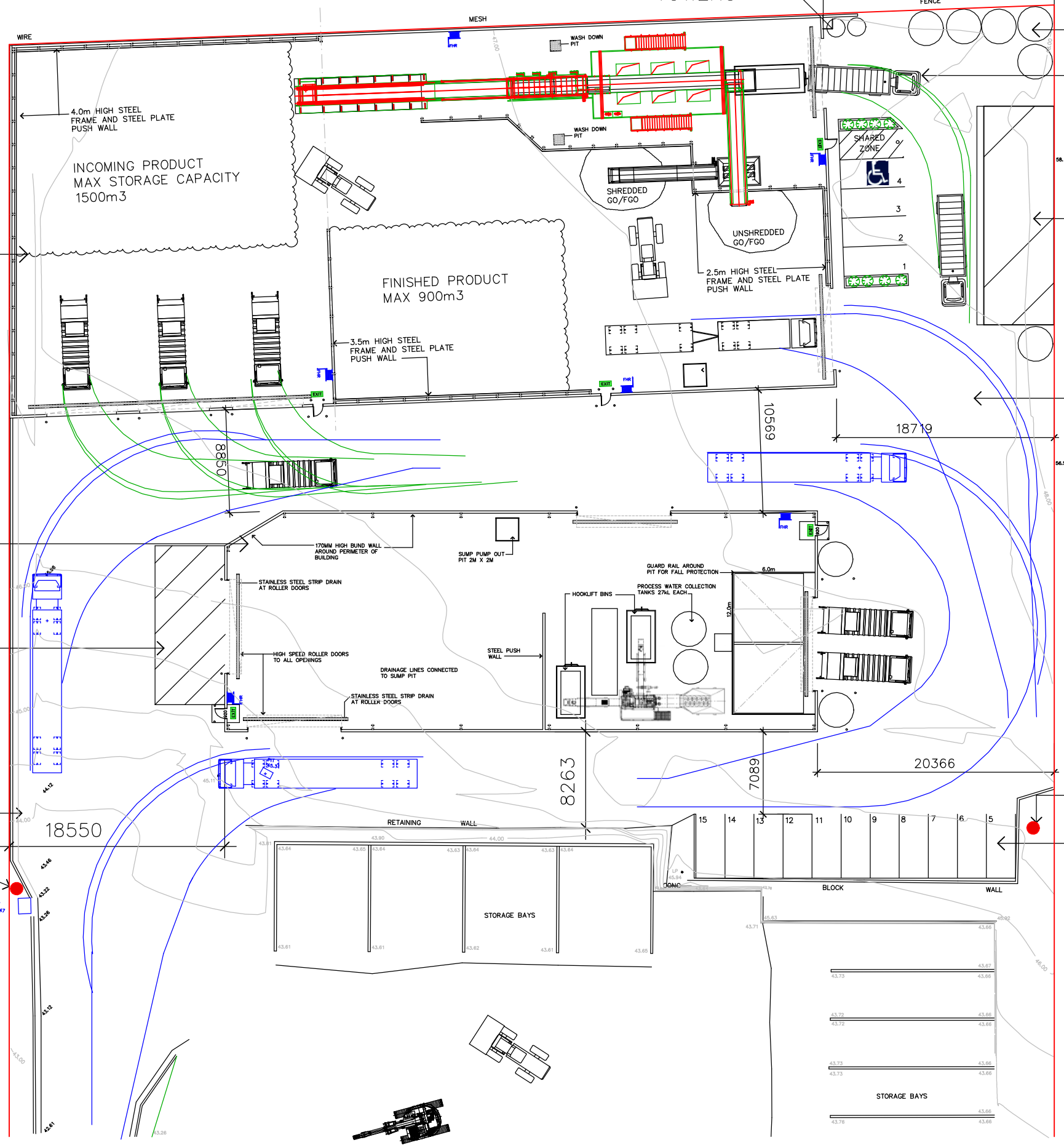
TRUCK LOADING BAY 6m x 13.5m

WIDEN ROAD TO ALLOW FOR TRUCK TURNING

NEW FIRE HYDRANT STAND POINT AS PER AUSTRALIAN STANDARDS

NEW FIRE HYDRANT STAND POINT AS PER AUSTRALIAN STANDARDS

CARPARKING 11 SPACES



PROPOSED PART SITE PLAN

SCALE 1: 200

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	GR		

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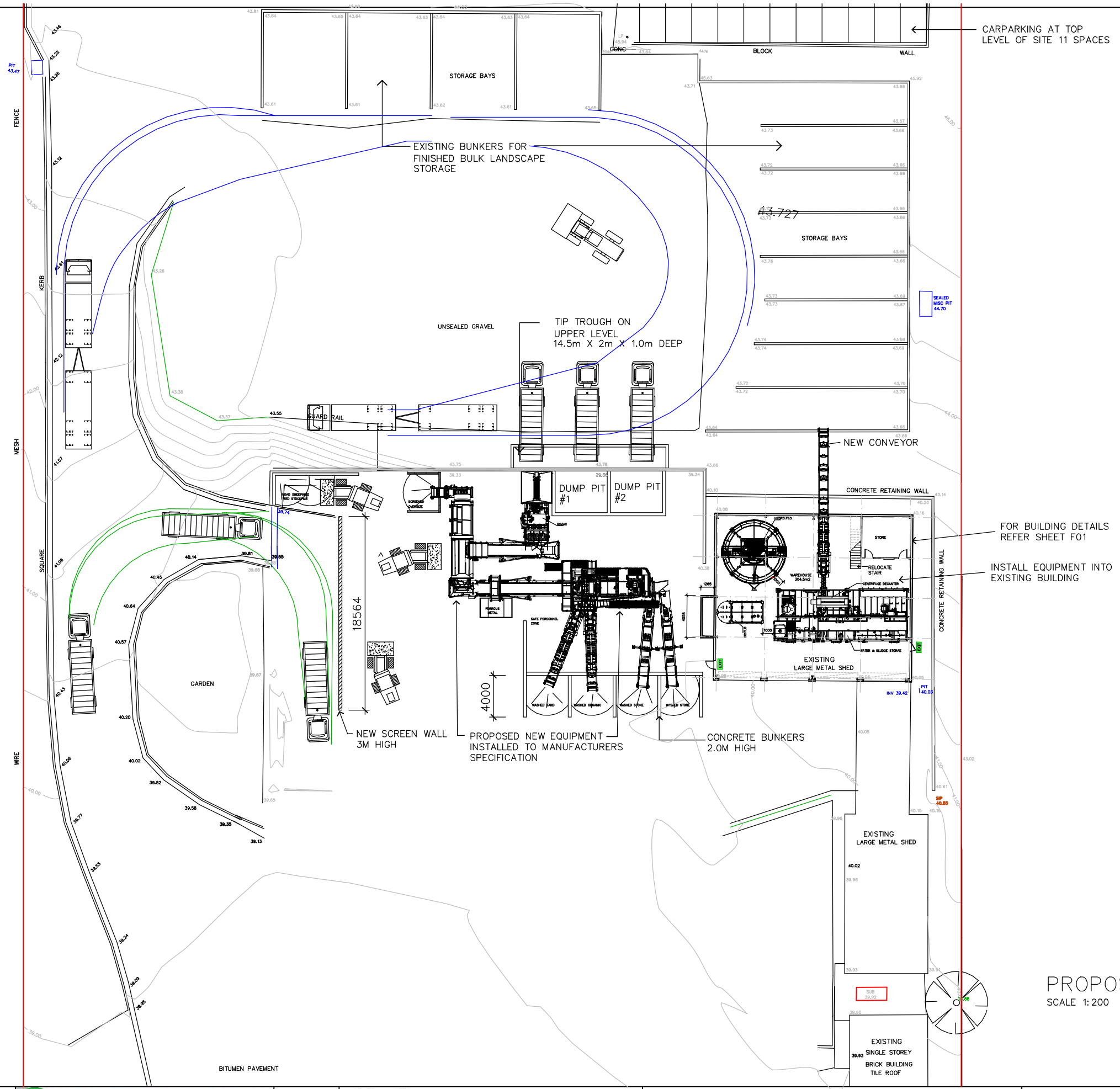
PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164	PROJECT NO.	1521
CLIENT	BETTERGROW	SCALE	1: 200
TITLE	ORGANICS RECEIVAL AND PROCESS BUILDING SITE PLAN	JOB NO.	0604–16
		SHEET NO.	A02
		ISSUE	A

A1 SHEET



PROPOSED PART SITE PLAN

SCALE 1: 200

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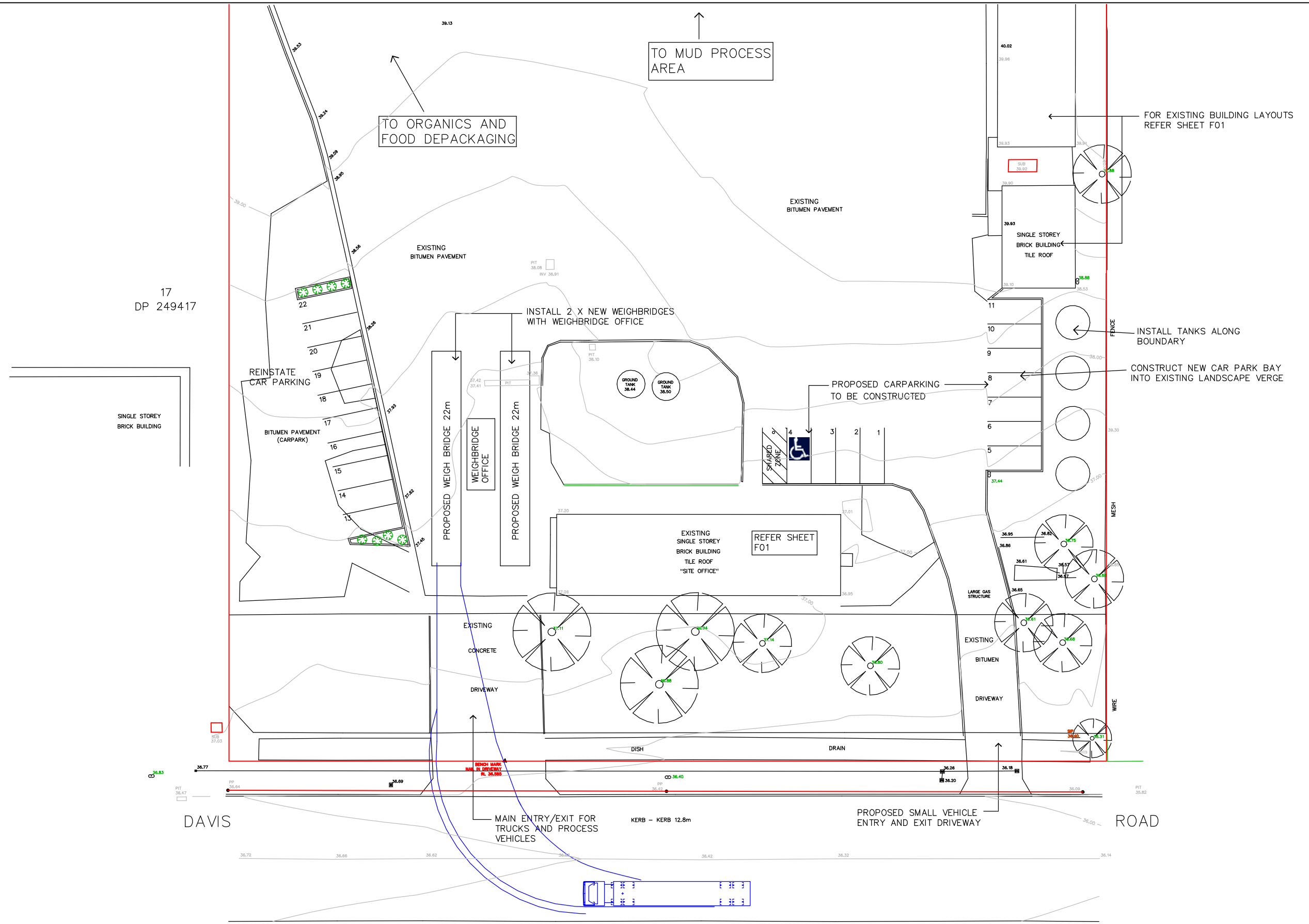
PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164
PROJECT NO.	1521
CLIENT	BETTERGROW
SCALE	1: 200
TITLE	MUD PROCESS AREA PROPOSED SITE PLAN
JOB NO.	0604– 16
SHEET NO.	A03
ISSUE	A

A1 SHEET



PROPOSED PART SITE PLAN

SCALE 1: 200

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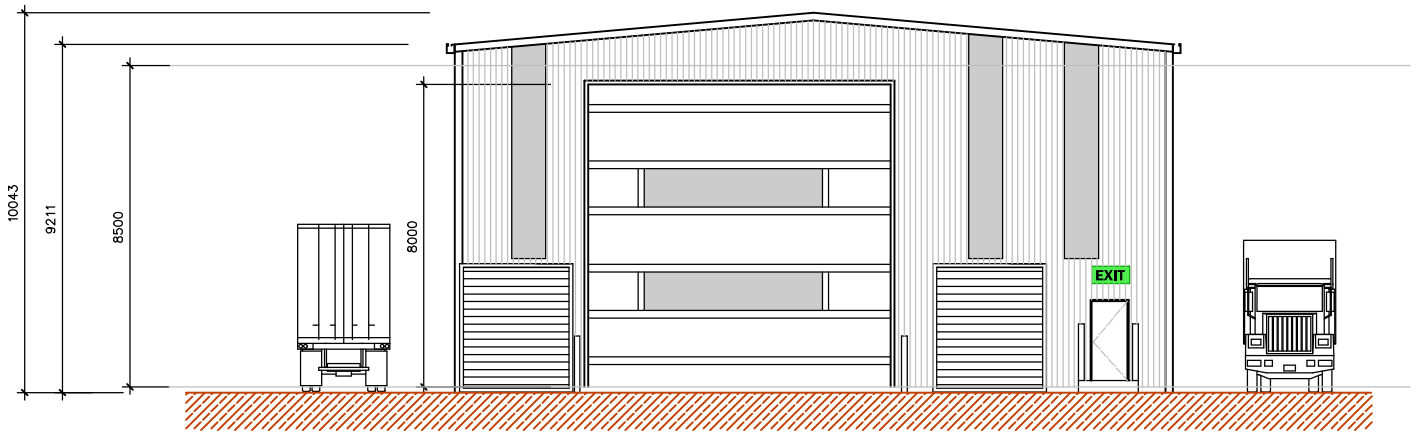
PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164
PROJECT NO.	1521
CLIENT	BETTERGROW
SCALE	1: 200
TITLE	SITE ENTRY AND PARKING PROPOSED SITE PLAN
JOB NO.	0604– 16
SHEET NO.	A04
ISSUE	A

A1 SHEET



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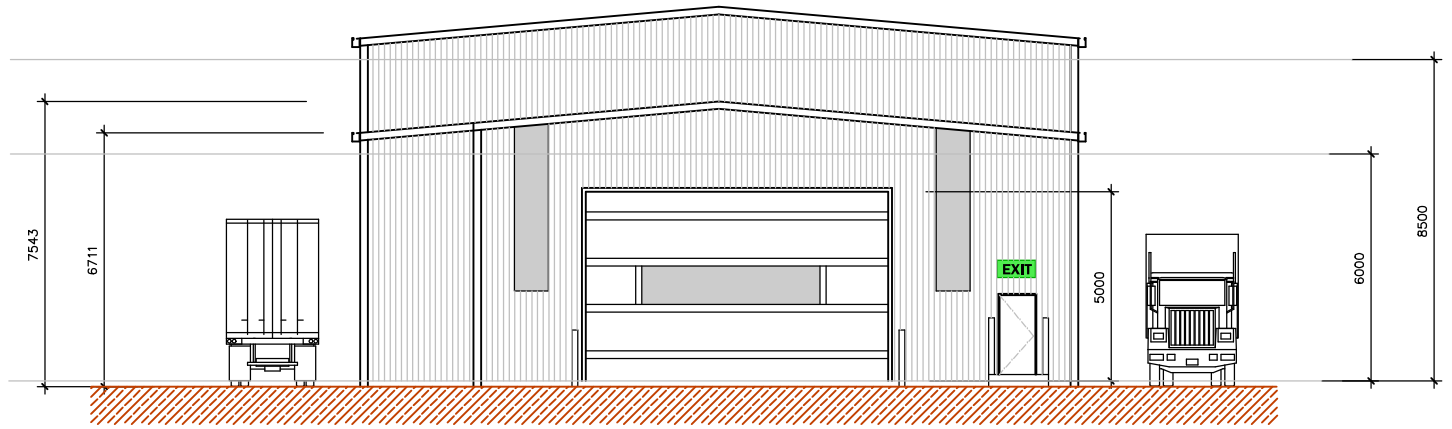

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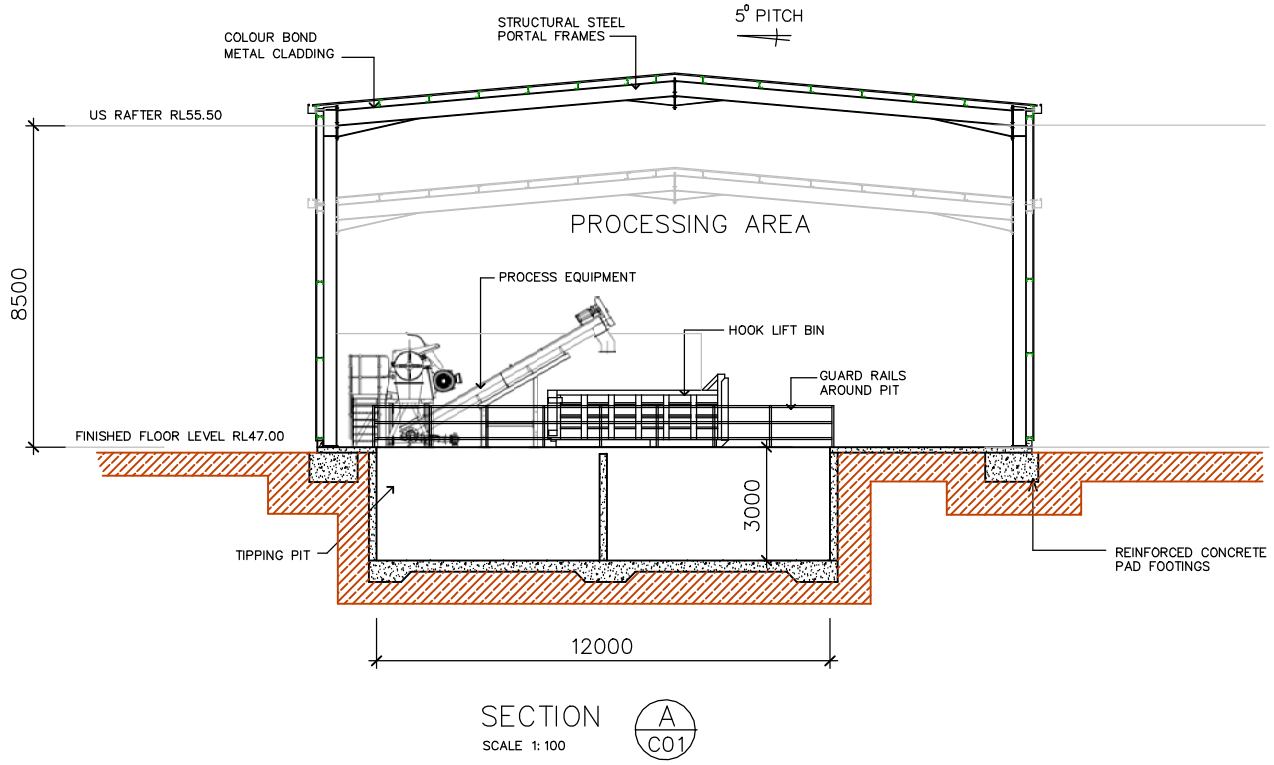

SECTION A C01

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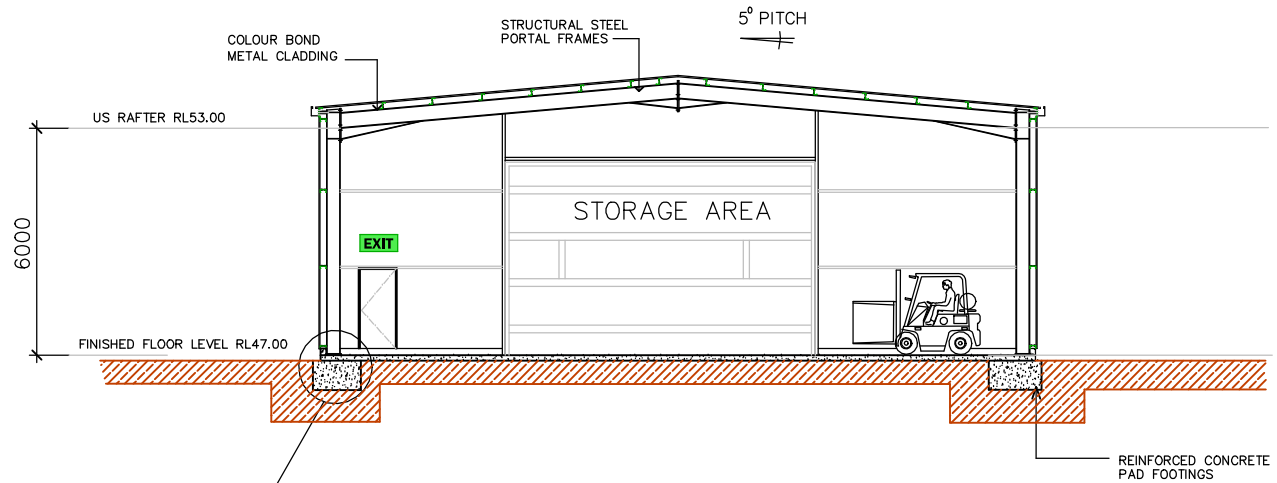
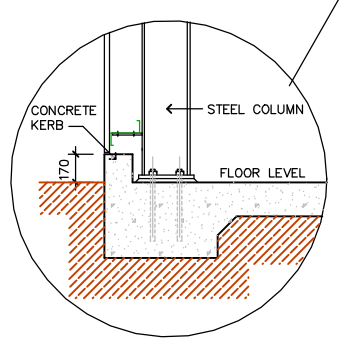


SECTION B C01

SCALE 1: 100



PERIMETER KERB DETAIL

FOR VISUAL CONCEPTS ONLY

ISSUE	BY	DESCRIPTION	DATE
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PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164		PROJECT NO. 1521
CLIENT	BETTERGROW		SCALE 1: 100
TITLE	FOOD DEPACKAGING AND PROCESS BUILDING FLOOR PLAN	JOB NO. 0604– 16	SHEET NO. C03 / ISSUE A

A1 SHEET

Appendix B

DPI Registered Groundwater Bores

NSW Office of Water

Work Summary

GW103822

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:	Auger		
Owner Type:			
Commenced Date:		Final Depth:	9.00 m
Completion Date:	30/01/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	100			Auger
1	1	Casing	P.V.C.	-0.30	9.00	50			
1	1	Opening	Screen	6.00	9.00	50		1	PVC

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103822 ***

NSW Office of Water

Work Summary

GW103823

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:	Auger		
Owner Type:			
Commenced Date:		Final Depth:	15.00 m
Completion Date:	31/05/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	15.00	100			Auger
1	1	Casing	P.V.C.	-0.30	15.00	50			
1	1	Opening	Screen	12.00	15.00	50		1	PVC

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103823 ***

NSW Office of Water

Work Summary

GW103824

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	15.00 m
Completion Date:	31/05/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate	Unknown

Source:

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	15.00	100			Auger
1	1	Casing	P.V.C.	-0.30	15.00	50			
1	1	Opening	Screen	0.00	15.00	50		1	PVC

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103824 ***

NSW Office of Water

Work Summary

GW111392

Licence:	10BL604252	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	6.00 m
Completion Date:	06/10/2010	Drilled Depth:	6.00 m
Contractor Name:			
Driller:	Stoffer De Haan		
Assistant Driller:			
Property:	LEND LEASE REAL ESTATE INV 29C DAVIS ROAD WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
		County	Parish	Cadastre	
	Form A:	CUMBE	CUMBE.41	100//864960	
	Licensed:				
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6254139.0	Latitude:	33°50'06.8"S
Elevation Source:	Unknown	Easting:	306098.0	Longitude:	150°54'16.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	50			Auger - Solid Flight
1		Backfill	Bentonite	1.00	3.00				
1		Annulus	Waterworn/Rounded	3.00	6.00				Graded
1	1	Casing	Pvc Class 9	0.00	3.00	50	46		Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	50		1	Casing - Machine Slotted, PVC Class 9, Screwed, SL: 150.0mm, A: 0.20mm

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	FILL	Fill	
1.00	3.50	2.50	CLAY,RED BROWN,FIRM	Clay	
3.50	4.00	0.50	SAND,CLAYEY	Sand	
4.00	5.00	1.00	CLAY GRAVELLY,BROWN	Clay	
5.00	6.00	1.00	CLAY AND SHALE INTERBEDDED	Clay	

Remarks

*** End of GW111392 ***

NSW Office of Water

Work Summary

GW105474

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.30 m
Completion Date:	10/06/2003	Drilled Depth:	9.30 m
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253415.0	Latitude:	33°50'30.6"S
Elevation Source:	Unknown	Easting:	306574.0	Longitude:	150°54'34.2"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.30	100			Unknown

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	9.30	9.30	SHALE, BROWN	Shale	

Remarks

*** End of GW105474 ***

NSW Office of Water

Work Summary

GW105475

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.50 m
Completion Date:	10/06/2003	Drilled Depth:	9.50 m
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253513.0	Latitude:	33°50'27.4"S
Elevation Source:	Unknown	Easting:	306541.0	Longitude:	150°54'33.0"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.50	100			Unknown

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	9.50	9.50	SHALE, BROWN	Shale	

Remarks

*** End of GW105475 ***

NSW Office of Water

Work Summary

GW105476

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.50 m
Completion Date:	10/06/2003	Drilled Depth:	
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253658.0	Latitude:	33°50'22.7"S
Elevation Source:	Unknown	Easting:	306592.0	Longitude:	150°54'35.1"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	9.50	100			Unknown

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW105476 ***

NSW Office of Water

Work Summary

GW109317

Licence:	10BL602582	Licence Status:	CANCELLED
		Authorised Purpose(s):	TEST BORE
		Intended Purpose(s):	TEST BORE
Work Type:	Bore		
Work Status:	Test Hole		
Construct.Method:	Rotary Air		
Owner Type:	Private		
Commenced Date:		Final Depth:	165.00 m
Completion Date:	09/09/2008	Drilled Depth:	165.00 m
Contractor Name:	INTERTEC DRILLING SERVICES		
Driller:	William Crump		
Assistant Driller:			
Property:	BORAL RESOURCES (NSW) PTY LTD LOT 2 HASSALL STREET WETHERILL PARK 2164 NSW	Standing Water Level:	19.000
GWMA:		Salinity:	
GW Zone:		Yield:	2.100

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.41	2//1038293
Licensed:			

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6254729.0	Latitude:	33°49'48.1"S
Elevation Source:	Unknown	Easting:	306717.0	Longitude:	150°54'40.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	1.50	305			Rotary Air
1		Hole	Hole	1.50	17.30	245			Rotary Air
1		Hole	Hole	17.30	165.00	157			Down Hole Hammer
1	1	Casing	Pvc Class 9	-0.40	47.60	140			Suspended in Clamps, Screwed and Glued
1	1	Casing	Steel	-0.40	19.10	157	147		Driven into Hole, Welded

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
53.00	54.00	1.00	Unknown			0.45			6050.00
101.50	101.60	0.10	Unknown			0.15			6150.00
127.10	127.20	0.10	Unknown			0.70			10000.00
163.80	163.90	0.10	Unknown	19.00		2.10			10000.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	FILL	Fill	
1.50	10.00	8.50	SANDY CLAY,HARD BANDS OF ROCKS	Sandy Clay	
10.00	12.00	2.00	BROWN SHALE	Breccia	
12.00	15.00	3.00	SHALE V/SOFT	Shale	
15.00	37.50	22.50	SHALE GREY	Shale	
37.50	41.00	3.50	SILT,SANDSTONE HARD	Silt	
41.00	53.00	12.00	SANDSTONE V/HARD	Sandstone	
53.00	54.00	1.00	SILTS,SANDSTONE LIGHTLY FACTURED	Siltstone	
54.00	62.00	8.00	SILTS HARD	Siltstone	
62.00	64.00	2.00	SHALE HARD	Shale	
64.00	81.00	17.00	SILTS HARD	Siltstone	
81.00	101.50	20.50	SHALE, BLACK, HARD	Shale	
101.50	101.60	0.10	SHALE, FRACTURED	Shale	
101.60	127.10	25.50	SANDSTONE GREY	Sandstone	
127.10	127.20	0.10	SANDSTONE FRACTURED	Sandstone	
127.20	135.00	7.80	SANDSTONE GREY	Sandstone	
135.00	135.40	0.40	SANDSTONE F/QUARTZ	Sandstone	
135.40	163.80	28.40	SANDSTONE GREY	Sandstone	
163.80	163.90	0.10	SANDSTONE FRACTURED	Sandstone	
163.90	165.00	1.10	SANDSTONE GREY	Sandstone	

Remarks

*** End of GW109317 ***

NSW Office of Water

Work Summary

GW110063

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:			
Owner Type:	Private		
Commenced Date:		Final Depth:	5.00 m
Completion Date:	09/01/2006	Drilled Depth:	5.00 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253105.0	Latitude:	33°50'39.9"S
Elevation Source:	Unknown	Easting:	305413.0	Longitude:	150°53'48.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.00	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL, CRUSHED ROCK,SHALE,SANDSTONE,SOME CLAY,BROWN	Fill	
0.40	3.50	3.10	SILTY CLAY,BROWN,PLASTIC,FIRM HOMOGENOUS,MOIST	Silty Clay	
3.50	4.50	1.00	MATERIAL BECOMING VERY HARD,NO ODOUR	Mafic	
4.50	5.00	0.50	WEATHERED SHALE,CLAY,BROWN,SOME GREY WEAT.SHALE,GREY,	Unknown	

Remarks

*** End of GW110063 ***

NSW Office of Water

Work Summary

GW110064

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:			
Owner Type:	Private		
Commenced Date:		Final Depth:	1.10 m
Completion Date:	10/01/2006	Drilled Depth:	1.10 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253129.0	Latitude:	33°50'39.2"S
Elevation Source:	Unknown	Easting:	305472.0	Longitude:	150°53'51.1"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	1.10	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.10	1.10	FILL,GRAVEL,LOAM,SAND,SOME CLAY BROWN,FIRM,MOIST	Fill	

Remarks

*** End of GW110064 ***

NSW Office of Water

Work Summary

GW110065

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	4.90 m
Completion Date:	09/01/2006	Drilled Depth:	4.90 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253226.0	Latitude:	33°50'36.0"S
Elevation Source:	Unknown	Easting:	305422.0	Longitude:	150°53'49.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.90	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.60	0.60	FILL,SANDY LOAM,BROWN,SOME GRAVEL AND ROCK	Fill	
0.60	1.50	0.90	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
1.50	3.50	2.00	MATERIAL BECOMING VERY HARD,L/BROWN GREY	Mafic	
3.50	4.90	1.40	SOME IRONSTONE GRAVEL,L/BROWN,WEATHERED SHALE,CLAY BROWN	Soil	

Remarks

*** End of GW110065 ***

NSW Office of Water

Work Summary

GW110066

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	4.20 m
Completion Date:	09/01/2006	Drilled Depth:	4.20 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253172.0	Latitude:	33°50'37.7"S
Elevation Source:	Unknown	Easting:	305346.0	Longitude:	150°53'46.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.20	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,SANDY GRAVEL AND LOAM,BROWN,LOOSE,ROCK FRAGS.DRY	Fill	
0.40	1.50	1.10	SILTY CLAY BROWN,PLASTIC,FIRM HOMOGENOUS,DRY	Silty Clay	
1.50	3.60	2.10	MATERIAL BECOMING VERY HARD,L/BROWN,GREY	Mafic	
3.60	3.70	0.10	SOME IRONSTONE GRAVEL IN CLAY L/BROWN,MOIST	Soil	
3.70	4.20	0.50	WEATHERED SHALE,CLAY,BROWN HARD MOIST	Unknown	

Remarks

*** End of GW110066 ***

NSW Office of Water

Work Summary

GW110067

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	4.20 m
Completion Date:	09/01/2006	Drilled Depth:	4.20 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253199.0	Latitude:	33°50'36.8"S
Elevation Source:	Unknown	Easting:	305341.0	Longitude:	150°53'46.1"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.20	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	FILL,(ALLUVIUM) SANDY GRAVEL AND LOAM LOOSE,DRY,BROWN	Fill	
0.50	3.50	3.00	SANDY SILT,BROWN,SPECS,WHITE MEDIUM BROWN,DRY	Sandy Siltstone	
3.50	4.20	0.70	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST,IRONS./GRAVEL	Silcrete	

Remarks

*** End of GW110067 ***

NSW Office of Water

Work Summary

GW110068

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.00 m
Completion Date:	10/01/2006	Drilled Depth:	5.00 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253139.0	Latitude:	33°50'38.7"S
Elevation Source:	Unknown	Easting:	305332.0	Longitude:	150°53'45.7"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.00	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	SANDY SILT (ALLUVIUM) BROWN,WHITE GRAVEL,LOOSE,DRY	Sandy Siltstone	
1.50	3.00	1.50	SILTY CLAY BROWN,PLASTIC,FIRM, HOMOGENOUS,MOIST	Silty Clay	
3.00	4.40	1.40	MATERIAL BECOMING FIRM,TRACE OF GRIT,L/BROWN,GREY	Mafic	
4.40	5.00	0.60	WEATHERED SHALE,CLAY,BROWN,FIRM,BROWN-GREY,MOIST	Unknown	

Remarks

*** End of GW110068 ***

NSW Office of Water

Work Summary

GW110069

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	3.90 m
Completion Date:	10/01/2006	Drilled Depth:	3.90 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253174.0	Latitude:	33°50'37.6"S
Elevation Source:	Unknown	Easting:	305319.0	Longitude:	150°53'45.2"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	3.90	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,CRUSHED ROCK-SHALE,SANDSTONE,SOME CLAY BROWN	Fill	
0.40	3.00	2.60	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
3.00	3.80	0.80	MOIST,LIGHT BROWN SILTY CLAY,WET,MUDDY	Monzonite	
3.80	3.90	0.10	WEATHERED SHALE,CLAY,BROWN	Unknown	

Remarks

*** End of GW110069 ***

NSW Office of Water

Work Summary

GW110070

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Well

Work Status:

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 5.10 m

Completion Date: 21/04/2009 Drilled Depth: 5.10 m

Contractor Name: Macquarie Drilling

Driller: Dino Parisotto

Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast

River Basin: - Unknown

Area/District:

CMA Map:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Source: Unknown

Northing: 6253151.0

Easting: 305309.0

Latitude: 33°50'38.3"S

Longitude: 150°53'44.8"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.10	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,CRUSHED ROCK SHALE,SANDSTONE AND SOME CLAY, BROWN	Fill	
0.40	1.30	0.90	SANDY SILT (ALLUVIUM) BROWN,LOOSE,GRAVEL, DRY	Sandy Siltstone	
1.30	4.00	2.70	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
4.00	5.10	1.10	WEATHERED SHALE.CLAY,BROWN,HARD AND SOFT SECTIONS,MUDDY.	Unknown	

Remarks

*** End of GW110070 ***

NSW Office of Water

Work Summary

GW110071

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Well

Work Status:

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 5.10 m

Completion Date: 10/01/2006 Drilled Depth: 5.10 m

Contractor Name: Macquarie Drilling

Driller: Dino Parisotto

Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast

River Basin: - Unknown

Area/District:

CMA Map:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Source: Unknown

Northing: 6253217.0

Easting: 305368.0

Latitude: 33°50'36.2"S

Longitude: 150°53'47.2"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.10	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	FILL, CRUSHED ROCK-SHALE,SANDSTONE AND SOME CLAY.BROWN	Fill	
0.20	3.00	2.80	SANDY SILT,(ALLUVIUM) BROWN,LOOSE GRAVEL,LOOSE,DRY	Sandy Siltstone	
3.00	3.90	0.90	SILTY CLAY,BROWN,PLASTIC,FIRM, HOMOGENOUS,MOIST	Silty Clay	
3.90	5.10	1.20	WEATHERED SHALE/CLAY,BROWN,HARD AND SOFT SECTIONS,MUDDY	Unknown	

Remarks

*** End of GW110071 ***

NSW Office of Water

Work Summary

GW110072

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	4.00 m
Completion Date:	10/01/2006	Drilled Depth:	4.00 m
Contractor Name:	Macquarie Drilling		
Driller:	Unkown Unknown		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253200.0	Latitude:	33°50'36.8"S
Elevation Source:	Unknown	Easting:	305436.0	Longitude:	150°53'49.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.00	125			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.10	0.10	FILL,CRUSHED ROCK,SHALE,SANDSTONE	Fill	
0.10	1.50	1.40	SILTY CLAY,BROWN PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
1.50	2.60	1.10	MATERIAL BECOMING VERY HARD	Mafic	
2.60	3.80	1.20	MINOR STONE GRAVEL	Mica	
3.80	4.00	0.20	WEATHERED SHALE/CLAY,BROWN,HARD,MOIST.	Unknown	

Remarks

*** End of GW110072 ***

NSW Office of Water

Work Summary

GW111391

Licence: 10BL604252 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Bore

Work Status: Equipped

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 6.00 m

Completion Date: 06/10/2010 Drilled Depth: 6.00 m

Contractor Name:

Driller: Stoffer De Haan

Assistant Driller:

Property: LEND LEASE REAL ESTATE INV 29C DAVIS ROAD WETHERILL PARK 2164 NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.41	100//864960
Licensed:			

Region: 10 - Sydney South Coast

River Basin: - Unknown

Area/District:

CMA Map:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Source: Unknown

Northing: 6254190.0

Easting: 306291.0

Latitude: 33°50'05.3"S

Longitude: 150°54'23.8"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.00	50			Auger - Solid Flight
1		Backfill	Bentonite	2.00	3.00				
1		Annulus	Waterworn/Rounded	3.00	6.00				Graded
1	1	Casing	Pvc Class 9	0.00	3.00	50	46		Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	50		1	Casing - Machine Slotted, PVC Class 9, Screwed, SL: 150.0mm, A: 0.20mm

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.40	1.40	FILL	Fill	
1.40	1.90	0.50	GRAVELLY CLAY ,BROWN	Clay	
1.90	3.50	1.60	CLAY,ORANGE,BROWN	Clay	
3.50	6.00	2.50	CLAY,BROWN,FIRM	Clay	

Remarks

*** End of GW111391 ***

NSW Office of Water

Work Summary

GW111878

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.50 m
Completion Date:	23/04/2009	Drilled Depth:	5.50 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:				
		County	Parish	Cadastre
	Form A:	CUMBE	CUMBE.50	31//589097
	Licensed:			
Region:	10 - Sydney South Coast	CMA Map:		
River Basin:	- Unknown	Grid Zone:	Scale:	
Area/District:				
Elevation:	0.00 m (A.H.D.)	Northing:	6253631.0	Latitude: 33°50'23.6"S
Elevation Source:	Unknown	Easting:	306521.0	Longitude: 150°54'32.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.50	95			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	FILL,DARK BROWN	Fill	
0.20	0.50	0.30	SILTY CLAY,RD/BROWN	Silty Clay	
0.50	0.70	0.20	SILTY CLAY,DARK BROWN	Silty Clay	
0.70	2.00	1.30	SILTY CLAY PALE BROWN/YELLOW	Silty Clay	
2.00	3.00	1.00	CLAY GREY STIFF,DENSE	Clay	
3.00	5.00	2.00	SHALE/CLAY,WEATHERED BEDROCK,FREY	Shale	
5.00	5.50	0.50	BEDROCK SHALE,VERY HARD	Bedrock	

Remarks

*** End of GW111878 ***

NSW Office of Water

Work Summary

GW111879

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.80 m
Completion Date:	23/04/2009	Drilled Depth:	5.70 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:				
		County	Parish	Cadastre
	Form A:	CUMBE	CUMBE.50	31//589097
	Licensed:			
Region:	10 - Sydney South Coast	CMA Map:		
River Basin:	- Unknown	Grid Zone:	Scale:	
Area/District:				
Elevation:	0.00 m (A.H.D.)	Northing:	6253631.0	Latitude: 33°50'23.5"S
Elevation Source:	Unknown	Easting:	306472.0	Longitude: 150°54'30.4"E
GS Map:	-	MGA Zone:	0	Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.80	95			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	FILL,SAND PALE YELLOW/BROWN	Fill	
0.30	0.50	0.20	SILTY CLAY,PALE BROWN,WITH MINOR GREY,PLASTIC	Silty Clay	
0.50	0.70	0.20	IRONSTONE LAYER,DARK RED,DRY	Ironstone	
0.70	2.00	1.30	SILTY CLAY,PALE BROWN,PLASTIC	Silty Clay	
2.00	3.00	1.00	BEDROCK WEATHERED,GREY,VERY HARAD	Bedrock	
3.00	4.50	1.50	BEDROCK,SHALE,MEDIUM BROWN AND GREY	Shale	
4.50	5.70	1.20	BEDROCK SHALE,VERY HARD	Shale	

Remarks

*** End of GW111879 ***

NSW Office of Water

Work Summary

GW111880

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	6.20 m
Completion Date:	23/04/2009	Drilled Depth:	6.20 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	31//589097
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253462.0	Latitude:	33°50'29.0"S
Elevation Source:	Unknown	Easting:	306500.0	Longitude:	150°54'31.4"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.20	95			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.70	0.70	SILTY CLAY PALE BROWN	Silty Clay	
0.70	1.20	0.50	SILTY CLAY,GREY	Silty Clay	
1.20	2.00	0.80	BEDROCK WEATHERED,SILTY CLAY PURPLE/BROWN	Bedrock	
2.00	6.20	4.20	BEDROCK,CLAY,BROWN	Bedrock	

Remarks

*** End of GW111880 ***

NSW Office of Water

Work Summary

GW111881

Licence: 10BL603326 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Bore

Work Status: Equipped

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 6.50 m

Completion Date: 27/04/2009 Drilled Depth: 6.50 m

Contractor Name:

Driller: Dino Parisotto

Assistant Driller:

Property: SIMSMETAL HOLDINGS
35 - 37 FRANK ST
WETHERILL PARK 2164
NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	31//589097
Licensed:			

Region: 10 - Sydney South Coast

River Basin: - Unknown

Area/District:

CMA Map:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Source: Unknown

Northing: 6253678.0

Easting: 306482.0

Latitude: 33°50'22.0"S

Longitude: 150°54'30.9"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

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

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.50	95			Auger - Solid Flight

Water Bearing Zones

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

Geologists Log

Drillers Log

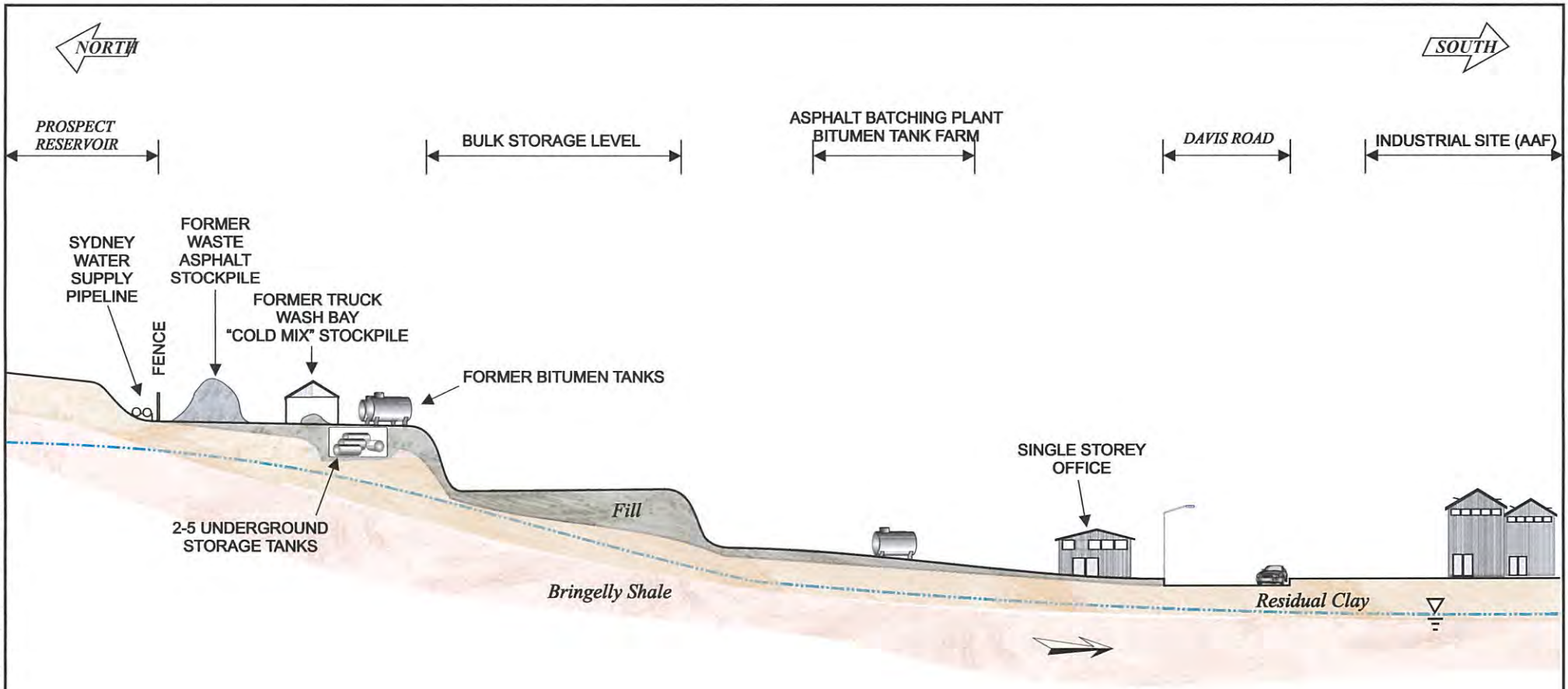
From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	FILL,SILTY LOAM,MINOR SILTY CLAY	Fill	
0.50	1.20	0.70	FILL,NO SILTY CLAY	Fill	
1.20	2.00	0.80	SILTY CLAY,RED/BROWN,PLASTIC,FIRM	Silty Clay	
2.00	3.00	1.00	SILTY CLAY,RED/BROWN,STIFF,NO ODOUR	Silty Clay	
3.00	5.00	2.00	BEDROCK WEATHERED,SILTY CLAY,LILGHT M/BROWN	Silty Clay	
5.00	6.50	1.50	BEDROCK,SHALE,SILTY CLAY,BROWN/GREY	Shale	

Remarks

*** End of GW111881 ***

Appendix C

Extracts from Previous Reports

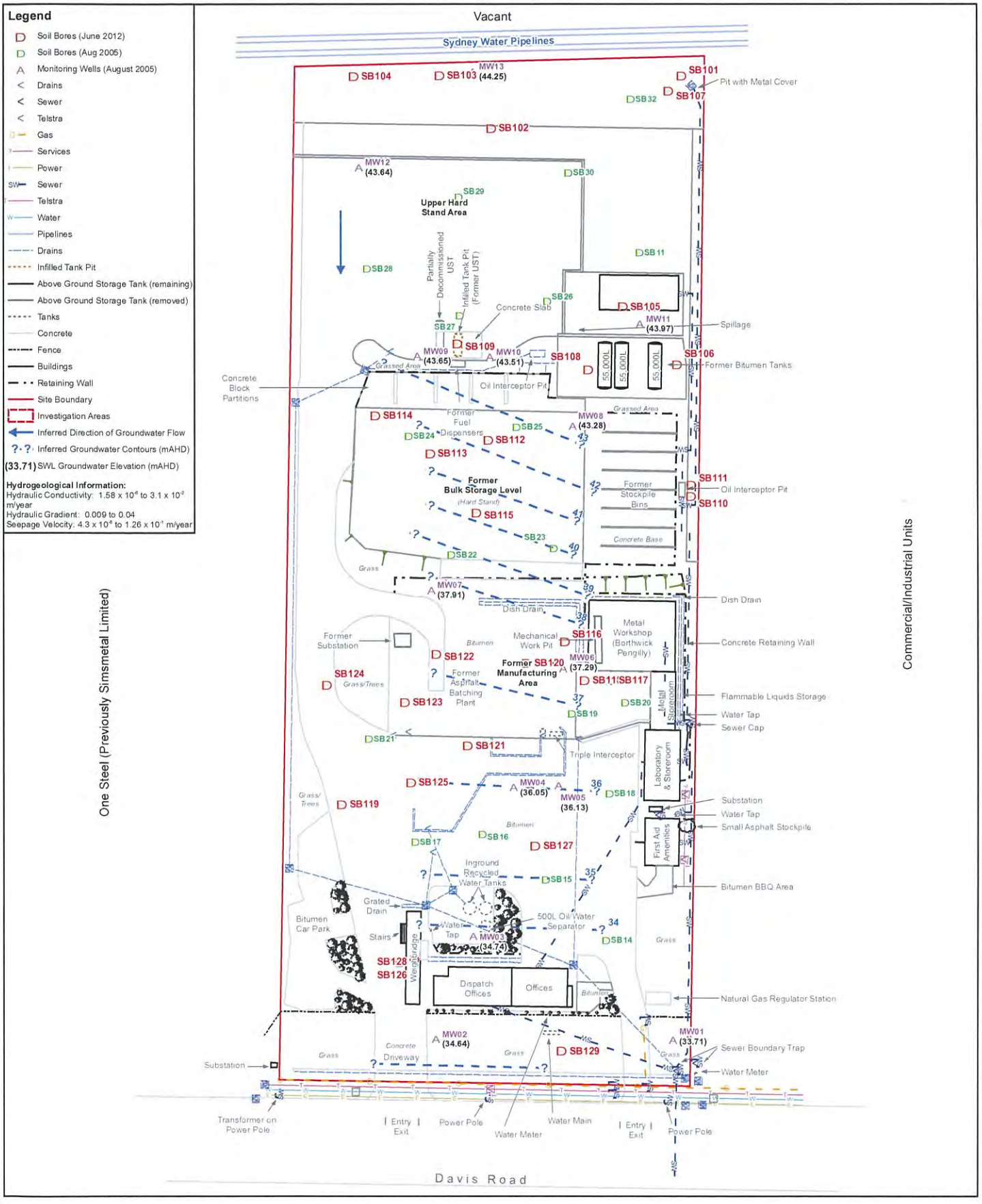


LEGEND

INFERRED GROUNDWATER LEVEL

INFERRED DIRECTION OF GROUNDWATER FLOW

CLIENT: MOBIL OIL AUSTRALIA PTY LTD PROJECT: ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW			TITLE: SITE CONCEPTUAL MODEL	
NOT TO SCALE	DESIGNED: KY DRAWN: BB DATE: 25/11/08	APPROVED: NR DATE: 25/11/08 STATUS: DRAFT	PROJECT: 42424135 CAD FILE: 006.CDR REVISION: A	FIGURE: 6



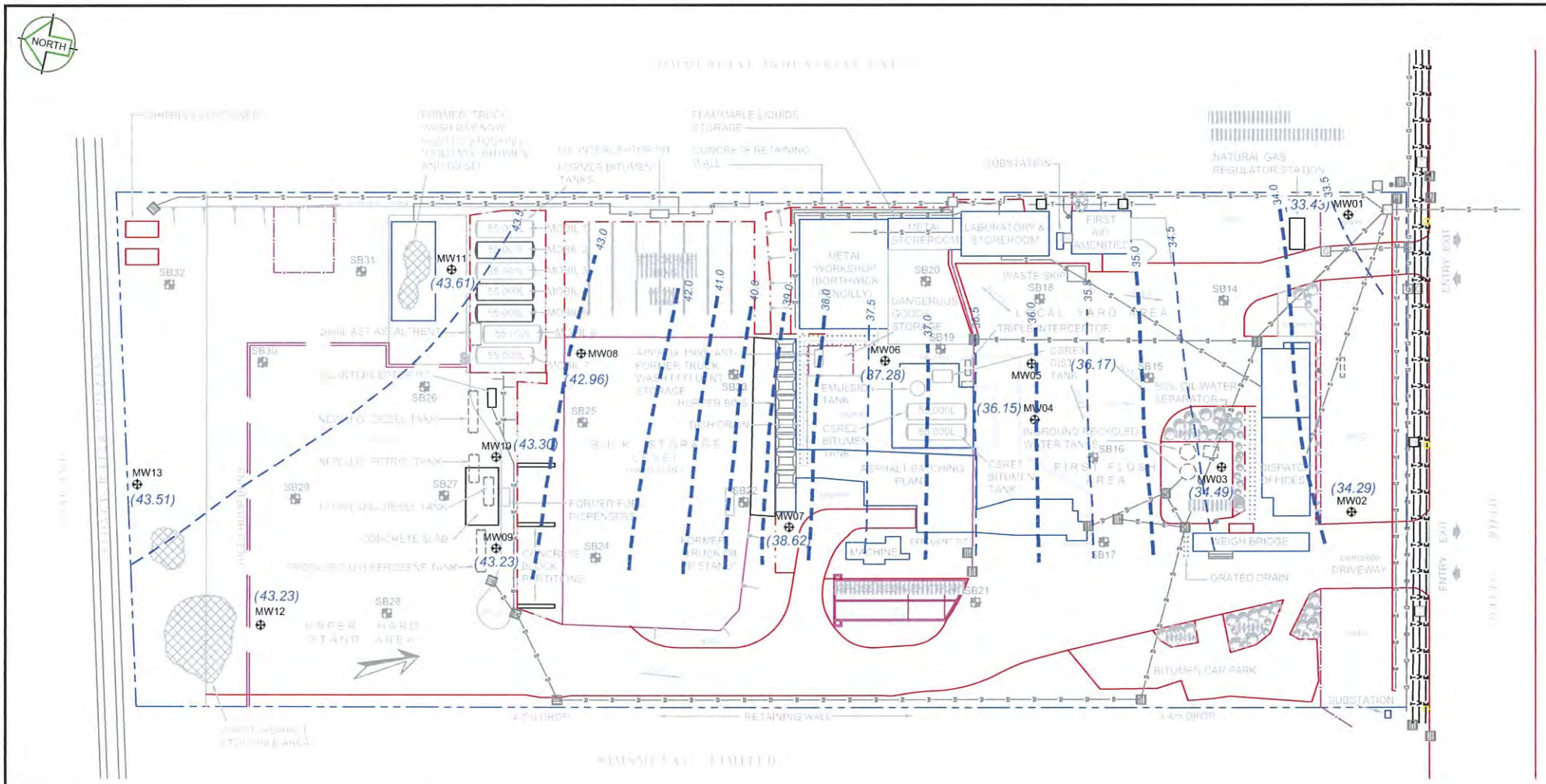
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING,
FORMER WETHERILL PARK EMOLEUM DEPOT

INFERRED CORRECTED GROUNDWATER MAP

URS | 24 DAVIS ROAD, WETHERILL PARK, NSW | Figure: 6

File No: 42424444.003.mxd | Drawn: STB | Approved: MF | Date: 07/08/2012 | Rev. A | A3



LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- GAS LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- STORMWATER DRAIN
- TELSTRA
- TOWN WATER
- 34.0 / 34.5 — INFERRED GROUNDWATER CONTOURS (1.0m & 0.5m contour interval) (mAHD)
- (34.32) STANDING WATER LEVELS (mAHD)

HYDROLOGICAL INFORMATION

HYDRAULIC CONDUCTIVITY = 8.64×10^{-7} to 1.2×10^{-3} m/day
HYDRAULIC GRADIENT = 0.03 ~ 0.10
SEEPAGE VELOCITY = 9.5×10^{-4} to 0.13 m/year

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - MARCH 2010, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

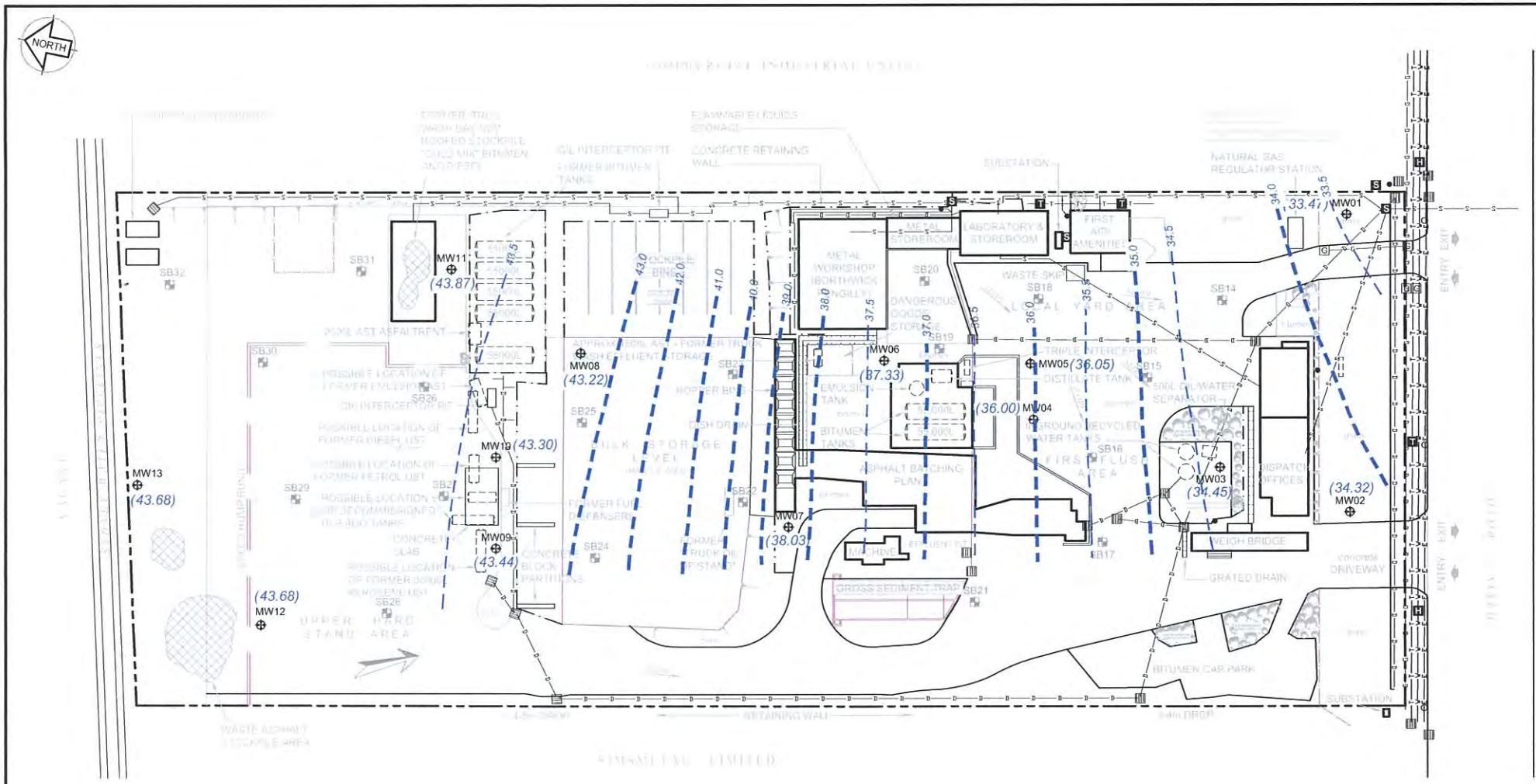
TITLE: **GROUNDWATER GRADIENT MAP**

A3

0 20 40
1:750 (metres)

DESIGNED: KY	APPROVED: NR	PROJECT: 42424273	FIGURE 4
DRAWN: BB	DATE: 08/04/2010	CAD FILE: 004.DWG	
DATE: 08/04/2010	STATUS: DRAFT	REVISION: A	

URS



LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 SOIL BORE (URS AUG 2005)
- MW11 MONITORING WELL (URS AUG 2005)
- GAS LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- STORMWATER DRAIN
- TELSTRA
- TOWN WATER
- 34.0 / 34.5 INFERRED GROUNDWATER CONTOURS (1.0m & 0.5m contour interval) (mAHD)
- (34.32) STANDING WATER LEVELS (mAHD)

HYDROLOGICAL INFORMATION

HYDRAULIC CONDUCTIVITY = 1×10^{-11} to 1.4×10^{-8} m/year
HYDRAULIC GRADIENT = 0.06
SEEPAGE VELOCITY = 5.3×10^{-5} to 2.7 m/year

CLIENT: MOBIL AUSTRALIA PTY LTD

PROJECT: ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE: GROUNDWATER GRADIENT MAP

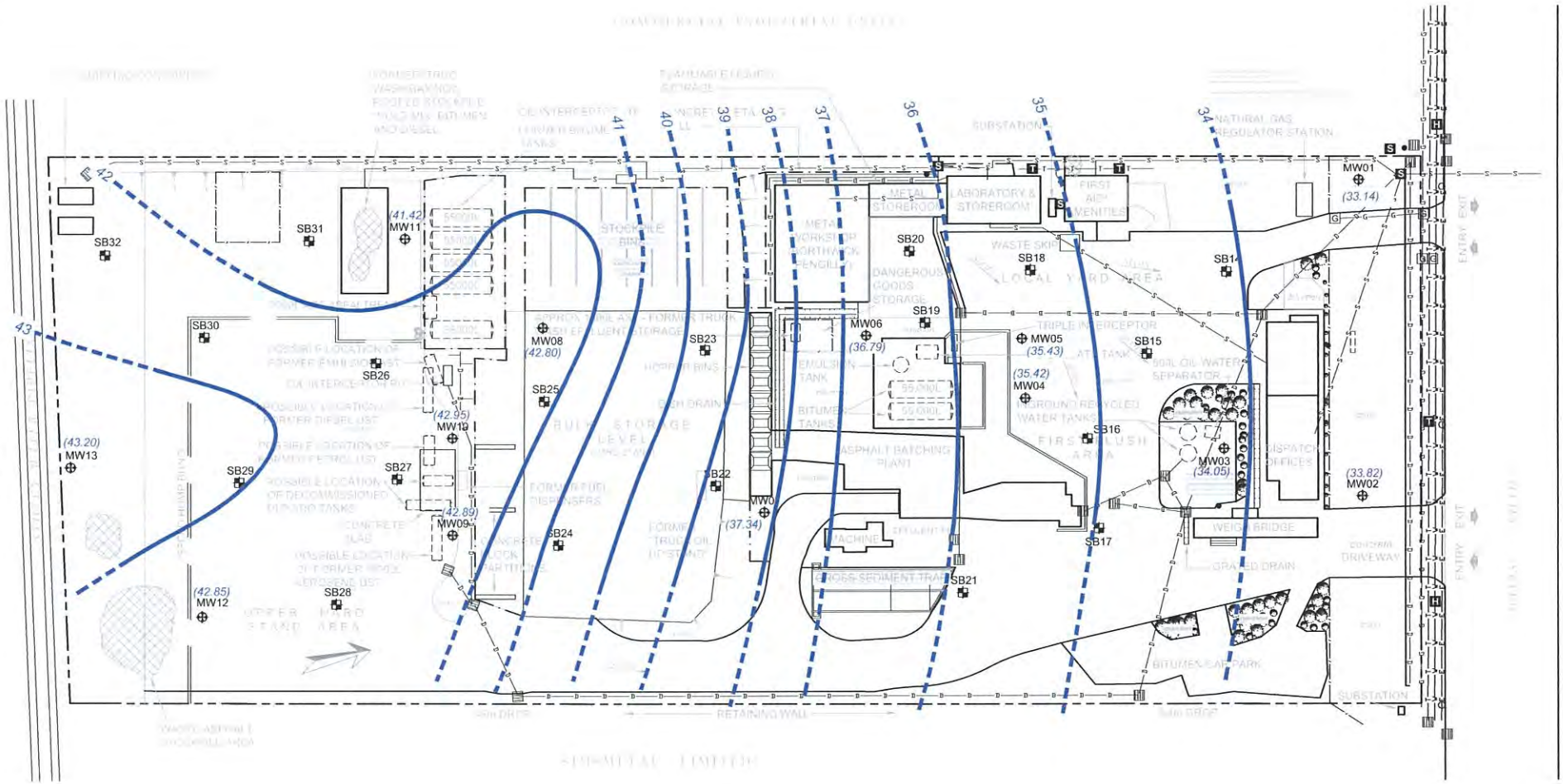
A3

0 20 40
1:750 (metres)

DESIGNED: KY | DRAWN: BB | DATE: 25/11/08
APPROVED: NR | DATE: 25/11/08 | STATUS: DRAFT
PROJECT: 42424135 | CAD FILE: 004.DWG | REVISION: A

URS

FIGURE 4



LEGEND

- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- STORMWATER DRAIN
- TOWN WATER
- GAS LINE
- TELSTRA LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- UNDERGROUND STORAGE TANK
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE

- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- H — HYDRANT/WATER PIT
- G — GAS PIT
- S — SEWER PIT
- T — TELSTRA PIT
- STORMWATER DRAIN
- WATER TAP OR METER
- STAINING AREA
- STOCKPILE AREA
- INFERRED DIRECTION OF GROUNDWATER FLOW

- 41 — INFERRED GROUNDWATER CONTOURS (mAHD)
- 41 — INFERRED GROUNDWATER CONTOURS (EXACT LOCATION UNSURE) (mAHD)
- (35.42) — SWL GROUNDWATER ELEVATION (mAHD)
- (-) — UNABLE TO COLLECT DATA

HYDROGEOLOGICAL INFORMATION:

HYDRAULIC CONDUCTIVITY: $1x10^{-6}$ to $1x10^{-2}$ m/year
HYDRAULIC GRADIENT: 0.001 - 0.116
SEEPAGE VELOCITY: $1x10^{-7}$ to 0.00035m/year

DATE DATA COLLECTED: 18/8/05 *MW13 GAUGED ON 28/5/05

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

TITLE: **GROUNDWATER GRADIENT MAP**

A3

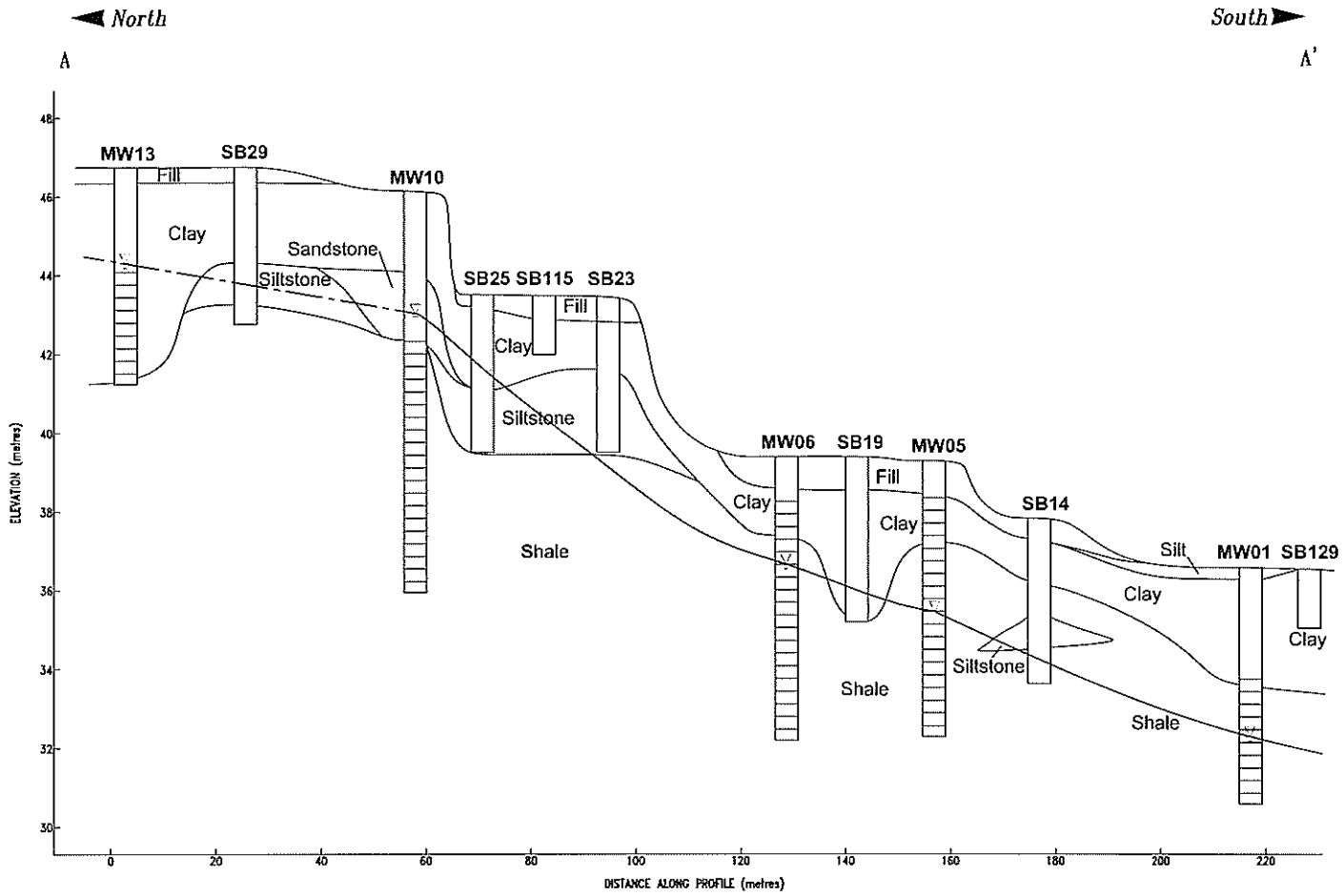
0 20 40
1:750 (metres)

DESIGNED: GVS | APPROVED:
DRAWN: TB | DATE:
DATE: 15/09/05 | STATUS: FINAL

PROJECT: 42423822
CAD FILE: 005.DWG
REVISION: A

URS

FIGURE 5



DESIGNED:	GVS	APPROVED:	
DRAWN:	AB	DATE:	
DATE:	08/08/12	STATUS:	FINAL

PROJECT: 42424444
CAD FILE: 005a.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05
20/06/12 to 25/07/12
25/06/12 to 27/06/12

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

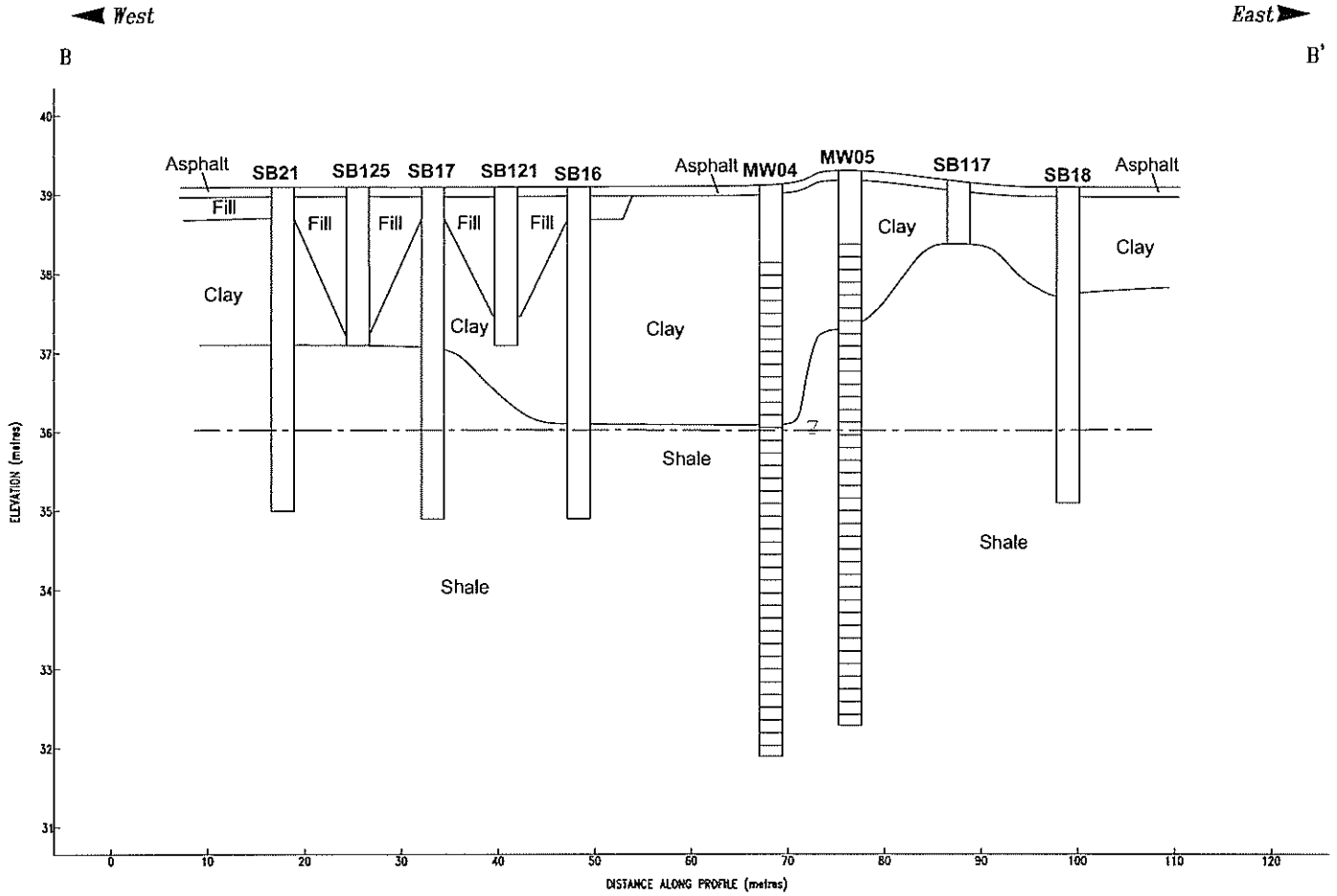
PROJECT
WETHERILL PARK TEST PITTING
FORMER WETHERILL PARK EMOLEUM DEPOT

TITLE
GEOLOGICAL CROSS SECTION A-A'

A3

URS

FIGURE 5a



DESIGNED:	GVS	APPROVED:	
DRAWN:	AB	DATE:	
DATE:	08/08/12	STATUS:	FINAL
PROJECT:	42424444		
CAD FILE:	005b.DWG		
REVISION:	A		

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 26/8/12
19/06/12 to 21/06/12
25/06/12 to 27/06/12

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

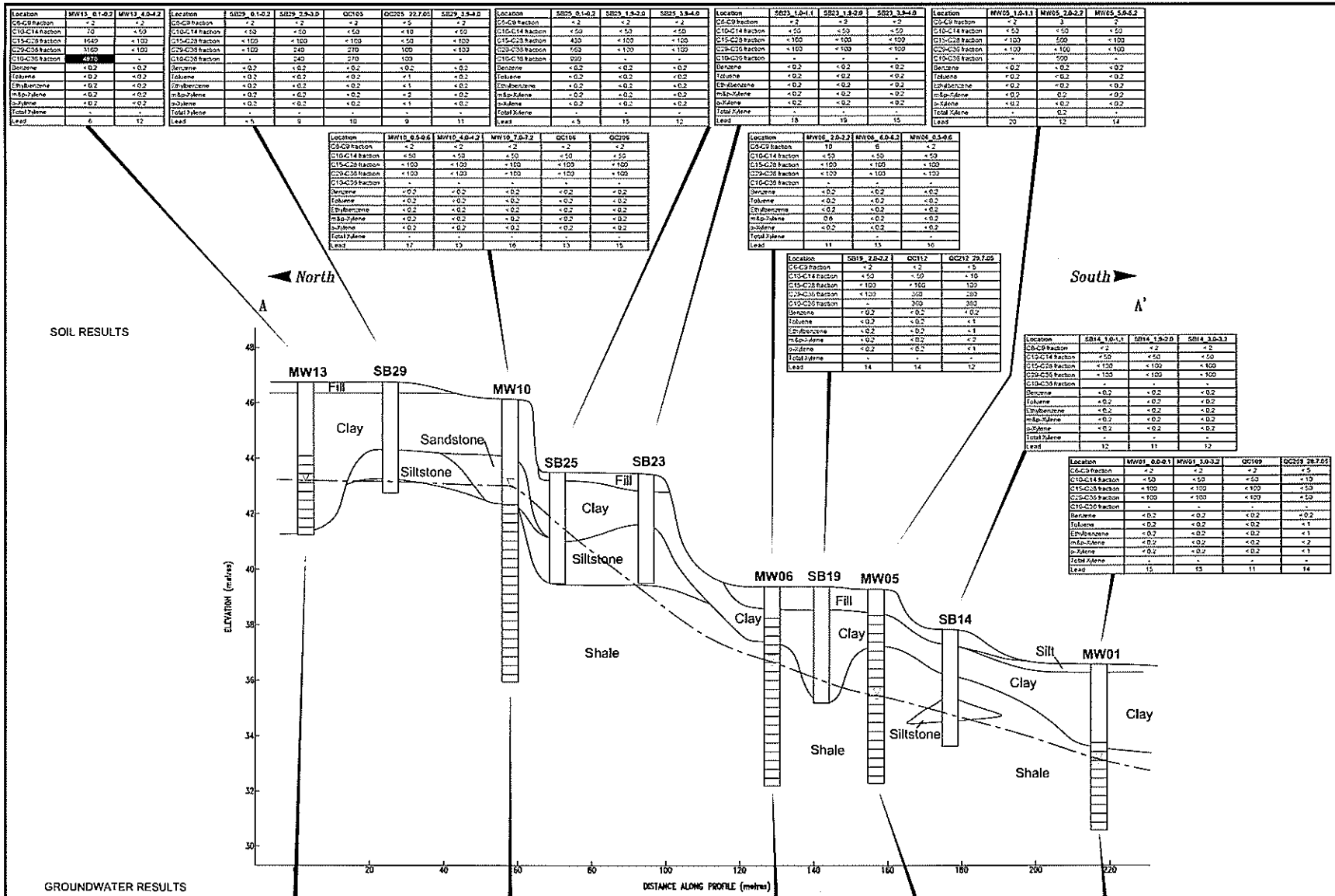
PROJECT
WETHERILL PARK TEST PITTING
FORMER WETHERILL PARK EMOLEUM DEPOT

TITLE
GEOLOGICAL CROSS SECTION B-B'

A3

URS

FIGURE
5b



Location	MW13_0.1-0.2	MW13_4.0-4.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	70	< 50
C15-C28 fraction	1640	< 100
C29-C36 fraction	1160	< 100
C10-C36 fraction	4070	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	6	12

Location	SB29_0.1-0.2	SB29_2.9-3.0	QC105	QC205 22.7.05	SB29_3.5-4.0
C6-C9 fraction	< 2	< 2	< 2	< 5	< 2
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 50	< 100
C29-C36 fraction	< 100	240	270	100	< 100
C10-C36 fraction	-	240	270	100	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
Total Xylene	-	-	-	-	-
Lead-5	< 5	9	10	9	11

Location	SB25_0.1-0.2	SB25_1.5-2.0	SB25_3.5-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	420	< 100	< 100
C29-C36 fraction	560	< 100	< 100
C10-C36 fraction	980	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	< 5	15	12

Location	SB23_1.0-1.1	SB23_1.9-2.0	SB23_3.9-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	18	19	15

Location	MW05_1.0-1.1	MW05_2.0-2.2	MW05_5.0-5.2
C6-C9 fraction	< 2	3	2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	500	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	500	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	0.2	-
Lead	20	12	14

Location	MW10_0.5-0.6	MW10_4.0-4.2	MW10_7.0-7.2	QC106	QC206
C6-C9 fraction	< 2	< 2	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100	< 100	< 100
C10-C36 fraction	-	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-	-	-
Lead	12	10	16	13	15

Location	MW06_2.0-2.2	MW06_4.0-4.2	MW06_6.5-6.6
C6-C9 fraction	10	6	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	0.6	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	11	13	16

Location	SB19_2.0-2.2	QC112	QC212 29.7.05
C6-C9 fraction	< 2	< 2	< 5
C10-C14 fraction	< 50	< 50	< 10
C15-C28 fraction	< 100	< 100	120
C29-C36 fraction	< 100	360	280
C10-C36 fraction	-	360	380
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 1
Ethylbenzene	< 0.2	< 0.2	< 1
m&p-Xylene	< 0.2	< 0.2	< 2
o-Xylene	< 0.2	< 0.2	< 1
Total Xylene	-	-	-
Lead	14	14	12

Location	SB14_1.0-1.1	SB14_1.9-2.0	SB14_3.0-3.2
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	12	11	12

Location	MW01_0.0-0.1	MW01_3.0-3.2	QC109	QC209 28.7.05
C6-C9 fraction	< 2	< 2	< 2	< 5
C10-C14 fraction	< 50	< 50	< 50	< 10
C15-C28 fraction	< 100	< 100	< 100	< 50
C29-C36 fraction	< 100	< 100	< 100	< 50
C10-C36 fraction	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 1
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 1
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 2
o-Xylene	< 0.2	< 0.2	< 0.2	< 1
Total Xylene	-	-	-	-
Lead	15	13	11	14

LOCATION	MW13_25/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	< 0.001
Total PAHs	-
Arsenic	< 0.001
Cadmium	< 0.0001
Chromium	< 0.001
Copper	< 0.001
Nickel	0.001
Zinc	0.008

LOCATION	MW10_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	< 0.001
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW06_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.001
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW05_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.002
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW01_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.001
Total PAHs	-
Arsenic	< 0.001
Cadmium	0.0028
Chromium	0.003
Copper	0.008
Nickel	0.006
Zinc	0.017

DESIGNED: GVS | APPROVED:
DRAWN: TB | DATE:
DATE: 15/09/05 | STATUS: FINAL
PROJECT: 42423822
CAD FILE: 004a.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

Exceeds Adopted Investigation levels

All soil concentrations in mg/kg
All groundwater concentrations in µg/L except metal concentrations measured in mg/L
ND - Not detected
FD - Field duplicate
FT - Field Triplicate
NA - Not Analysed

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE
GEOLOGICAL CROSS SECTION A-A'

A3

URS

FIGURE 4a

Location	SB17_0.1-0.2	SB17_2.9-3.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	< 100
C10-C36 fraction	-	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	< 5	8

Location	SB16_2.2-2.7	SB16_6.5-6.8
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	< 100
C10-C36 fraction	-	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	15	17

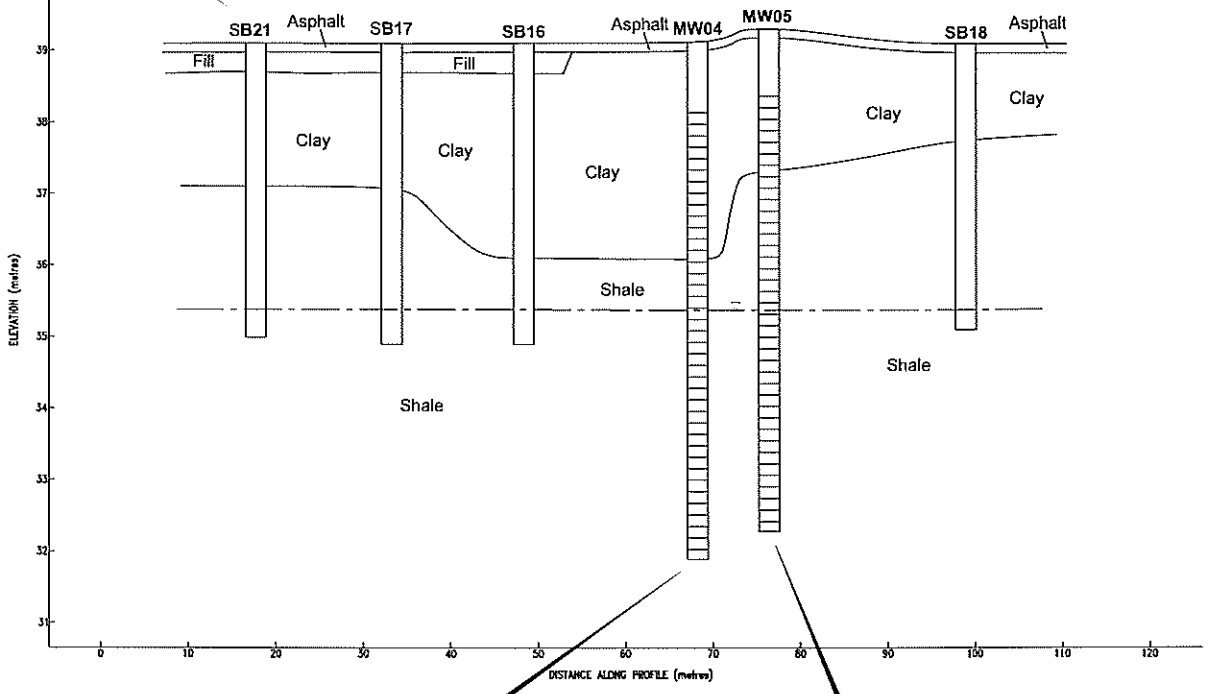
Location	MW04_0.3-0.5	MW04_4.0-4.3	MW04_6.0-6.2	QC111	QC211
C6-C9 fraction	< 2	< 2	3	5	5
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100	< 100	< 100
C10-C36 fraction	-	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-	-	-
Lead	20	11	15	15	14

Location	MW05_1.9-2.1	MW05_2.9-3.2	MW05_5.0-5.2
C6-C9 fraction	< 2	3	2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	500	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	500	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	0.2	-
Lead	20	12	14

Location	SB18_2.9-3.0	SB18_0.5-0.6	SB18_3.9-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	14	16	11

Location	SB21_0.5-0.6	SB21_4.0-4.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	250
C10-C36 fraction		250
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene		-
Lead	13	15

SOIL RESULTS



GROUNDWATER RESULTS

LOCATION	MW04_19/8/05	QC01	QC02_19.8.05
C6-C9 fraction	< 20	< 20	< 20
C10-C14 fraction	< 50	< 50	< 20
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 50	< 50	< 100
C10-C36 fraction	-	-	-
Benzene	< 1	< 1	< 0.5
Toluene	< 2	< 2	< 1
Ethylbenzene	< 2	< 2	< 1
m&p-Xylene	< 2	< 2	< 2
o-Xylene	< 2	< 2	< 1
Total Xylene	-	-	-
Lead	< 0.001	< 0.001	0.001
Total PAHs	-	-	<1
Arsenic	0.004	0.004	0.005
Cadmium	0.0002	0.0001	0.0002
Chromium	< 0.001	< 0.001	0.003
Copper	0.002	0.002	< 0.001
Nickel	0.015	0.016	0.016
Zinc	0.014	0.017	0.015

LOCATION	MW05_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.002
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

DESIGNED: GVS
DRAWN: TB
DATE: 16/09/05
APPROVED:
DATE:
STATUS: FINAL
PROJECT: 42423822
CAD FILE: 004b.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

Exceeds Adopted Investigation levels

All soil concentrations in mg/kg
All groundwater concentrations in µg/L except metal concentrations measured in mg/L
ND - Not detected
FD - Field duplicate
FT - Field Triplicate
NA - Not Analysed

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

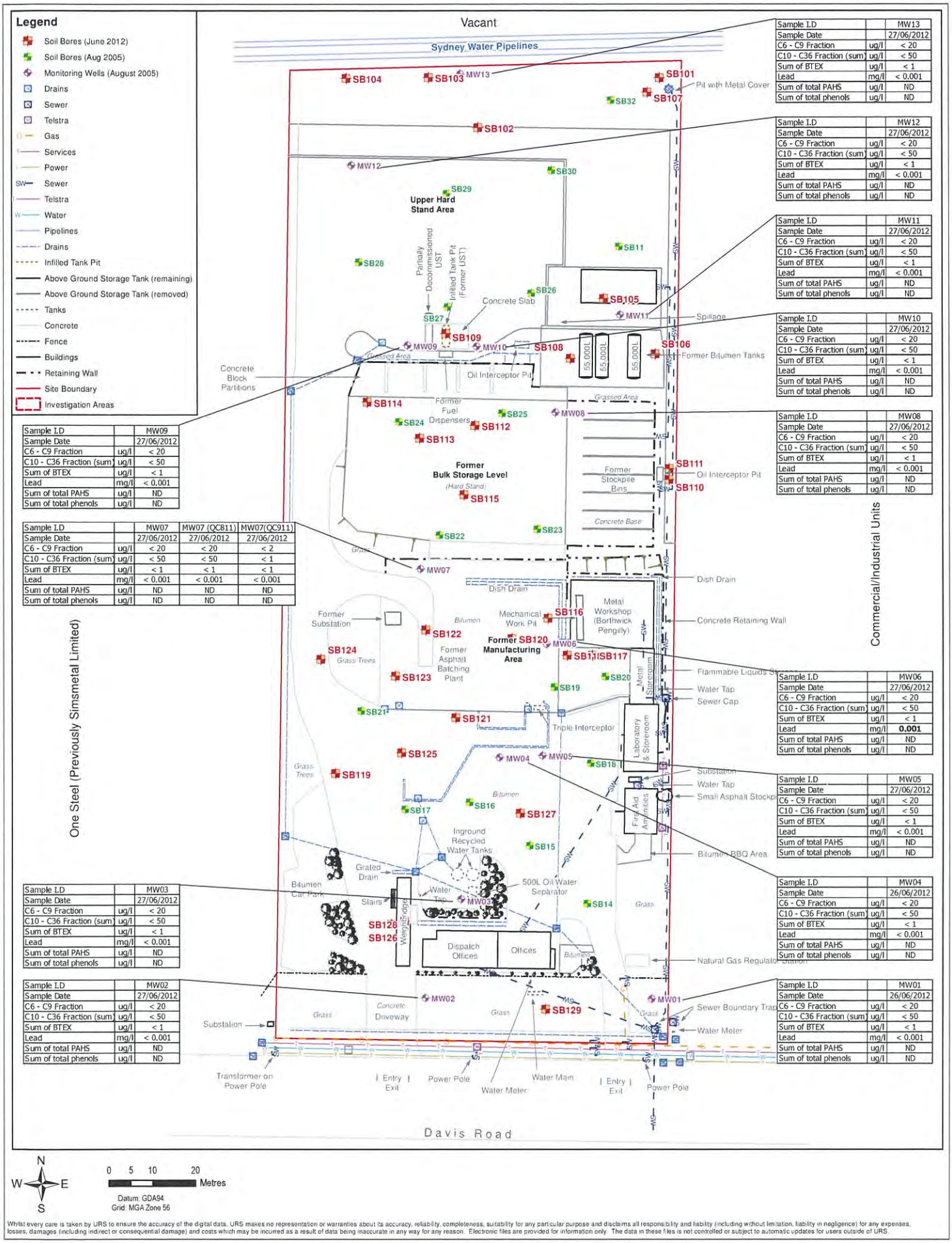
PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE
GEOLOGICAL CROSS SECTION B-B'

A3

URS

FIGURE
4b



Sample I.D		MW13
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW12
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW11
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW10
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW09
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW08
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW07	MW07 (QC811)	MW07(QC911)
Sample Date		27/06/2012	27/06/2012	27/06/2012
C6 - C9 Fraction	ug/l	< 20	< 20	< 2
C10 - C36 Fraction (sum)	ug/l	< 50	< 50	< 1
Sum of BTEX	ug/l	< 1	< 1	< 1
Lead	mg/l	< 0.001	< 0.001	< 0.001
Sum of total PAHS	ug/l	ND	ND	ND
Sum of total phenols	ug/l	ND	ND	ND

Sample I.D		MW06
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	**0.001**
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW05
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW04
Sample Date		26/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW03
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW02
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW01
Sample Date		26/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

N W E S

0 5 10 20 Metres

Datum: GDA94
Grid: MGA Zone 56

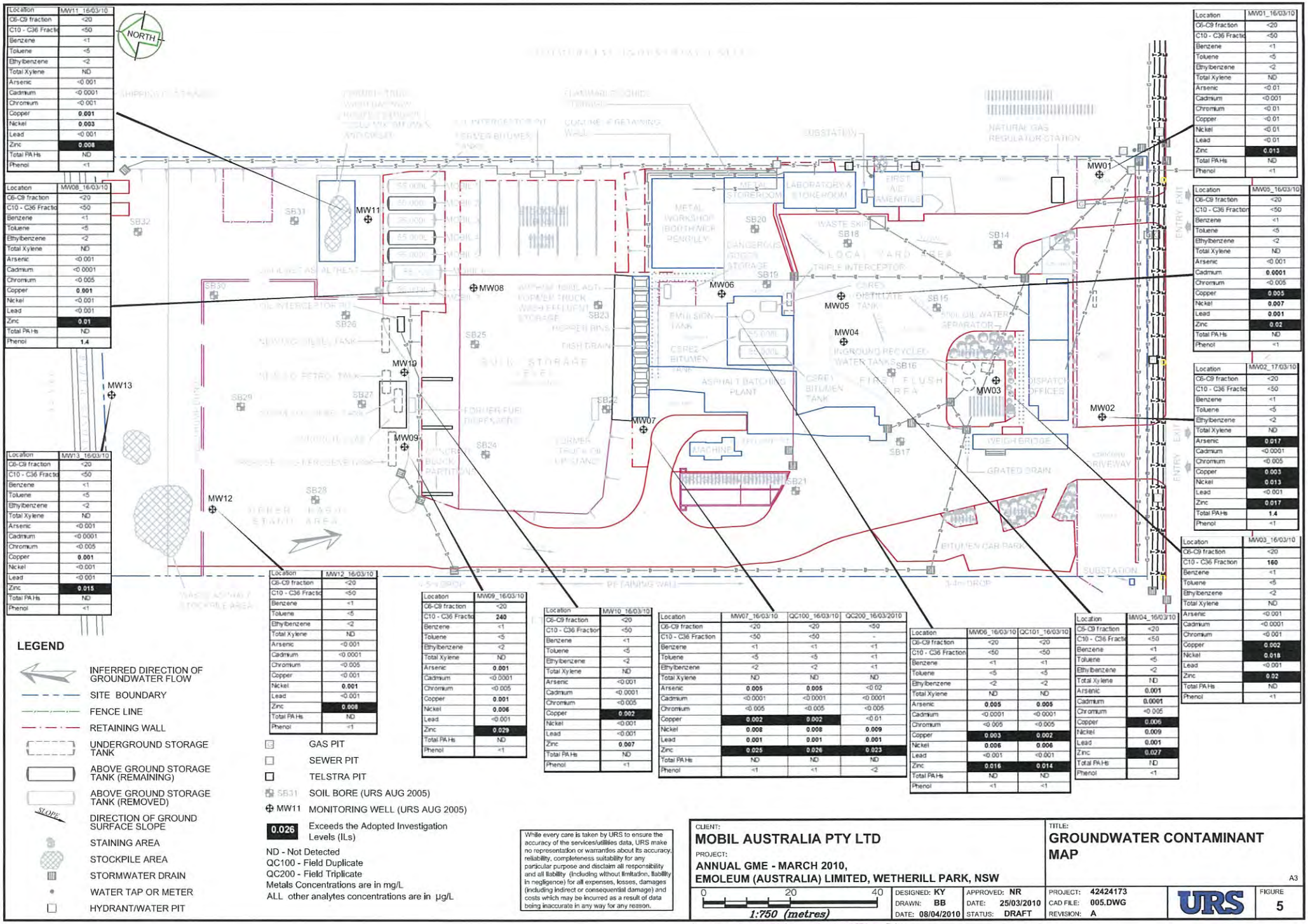
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING,
FORMER WETHERILL PARK EMOLEUM DEPOT

GROUNDWATER ANALYTICAL RESULTS MAP

URS | 24 DAVIS ROAD, WETHERILL PARK, NSW | Figure: 8

File No: 42424444.006.mxd | Drawn: STB | Approved: MF | Date: 08/08/2012 | Rev. A | A3



Location	MW11_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	**0.001**
Nickel	**0.003**
Lead	<0.001
Zinc	**0.008**
Total PAHs	ND
Phenol	<1

Location	MW08_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	<0.001
Lead	<0.001
Zinc	**0.01**
Total PAHs	ND
Phenol	**1.4**

Location	MW13_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	<0.001
Lead	<0.001
Zinc	**0.015**
Total PAHs	ND
Phenol	<1

Location	MW12_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	<0.001
Nickel	**0.001**
Lead	<0.001
Zinc	**0.008**
Total PAHs	ND
Phenol	<1

Location	MW09_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	**240**
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.001**
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	**0.006**
Lead	<0.001
Zinc	**0.029**
Total PAHs	ND
Phenol	<1

Location	MW10_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.002**
Nickel	<0.001
Lead	<0.001
Zinc	**0.007**
Total PAHs	ND
Phenol	<1

Location	MW07_16/03/10	QC100_16/03/10	QC200_16/03/2010
C6-C9 fraction	<20	<20	<50
C10 - C36 Fraction	<50	<50	-
Benzene	<1	<1	<1
Toluene	<5	<5	<1
Ethylbenzene	<2	<2	<1
Total Xylene	ND	ND	ND
Arsenic	**0.005**	**0.005**	<0.02
Cadmium	<0.0001	<0.0001	<0.0001
Chromium	<0.005	<0.005	<0.005
Copper	**0.002**	**0.002**	<0.01
Nickel	**0.008**	**0.008**	**0.009**
Lead	**0.001**	**0.001**	**0.001**
Zinc	**0.025**	**0.026**	**0.023**
Total PAHs	ND	ND	ND
Phenol	<1	<1	<2

Location	MW06_16/03/10	QC101_16/03/10
C6-C9 fraction	<20	<20
C10 - C36 Fraction	<50	<50
Benzene	<1	<1
Toluene	<5	<5
Ethylbenzene	<2	<2
Total Xylene	ND	ND
Arsenic	**0.005**	**0.005**
Cadmium	<0.0001	<0.0001
Chromium	<0.005	<0.005
Copper	**0.003**	**0.002**
Nickel	**0.006**	**0.006**
Lead	<0.001	<0.001
Zinc	**0.016**	**0.014**
Total PAHs	ND	ND
Phenol	<1	<1

Location	MW04_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.001**
Cadmium	**0.0001**
Chromium	<0.005
Copper	**0.006**
Nickel	**0.009**
Lead	**0.001**
Zinc	**0.027**
Total PAHs	ND
Phenol	<1

Location	MW01_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.01
Cadmium	<0.001
Chromium	<0.01
Copper	<0.01
Nickel	<0.01
Lead	<0.01
Zinc	**0.013**
Total PAHs	ND
Phenol	<1

Location	MW05_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	**0.0001**
Chromium	<0.005
Copper	**0.005**
Nickel	**0.007**
Lead	**0.001**
Zinc	**0.02**
Total PAHs	ND
Phenol	<1

Location	MW02_17/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.017**
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.003**
Nickel	**0.013**
Lead	<0.001
Zinc	**0.017**
Total PAHs	**1.4**
Phenol	<1

Location	MW03_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	**160**
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	**0.002**
Nickel	**0.018**
Lead	<0.001
Zinc	**0.02**
Total PAHs	ND
Phenol	<1

LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- **0.026** — Exceeds the Adopted Investigation Levels (ILs)

ND - Not Detected
QC100 - Field Duplicate
QC200 - Field Triplicate
Metals Concentrations are in mg/L
ALL other analytes concentrations are in µg/L

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - MARCH 2010, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

TITLE: **GROUNDWATER CONTAMINANT MAP**

A3

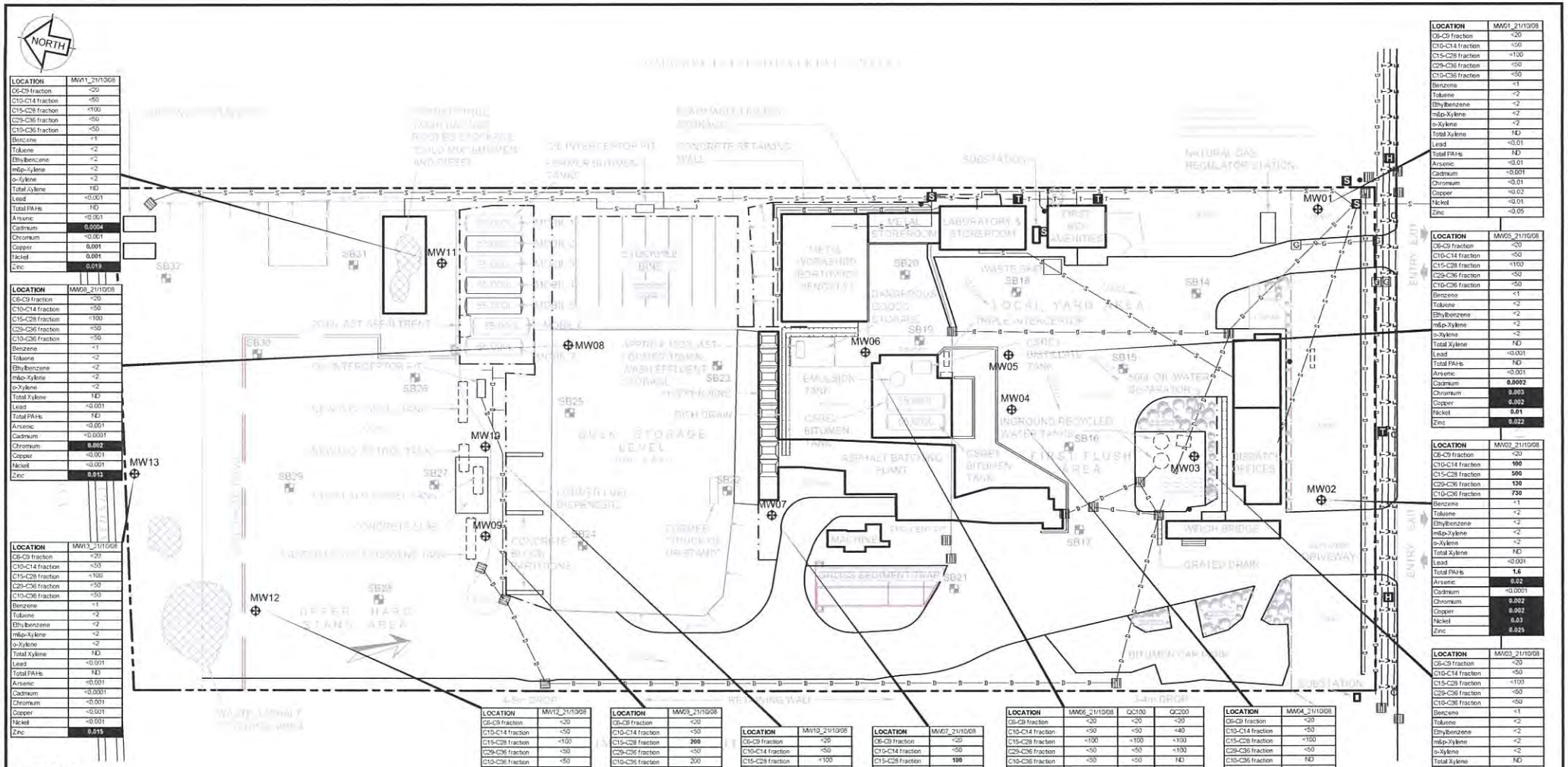
0 20 40
1:750 (metres)

DESIGNED: KY | APPROVED: NR
DRAWN: BB | DATE: 25/03/2010
DATE: 08/04/2010 | STATUS: DRAFT

PROJECT: 42424173
CAD FILE: 005.DWG
REVISION: A

URS

FIGURE 5



LOCATION	MW01_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	0.0004
Chromium	<0.001
Copper	0.001
Nickel	0.001
Zinc	0.019

LOCATION	MW08_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	0.002
Copper	<0.001
Nickel	<0.001
Zinc	0.013

LOCATION	MW13_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	<0.001
Nickel	<0.001
Zinc	0.013

LOCATION	MW12_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	<0.001
Nickel	<0.001
Zinc	0.026

LOCATION	MW09_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	200
C29-C36 fraction	<50
C10-C36 fraction	200
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	0.001
Cadmium	0.0004
Chromium	<0.001
Copper	<0.001
Nickel	0.012
Zinc	0.019

LOCATION	MW10_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	<0.001
Nickel	<0.001
Zinc	0.023

LOCATION	MW07_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	100
C29-C36 fraction	<50
C10-C36 fraction	100
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	0.013
Cadmium	0.0001
Chromium	0.002
Copper	0.002
Nickel	0.016
Zinc	0.022

LOCATION	MW06_21/10/08	QC100	QC200
C6-C9 fraction	<20	<20	<20
C10-C14 fraction	<50	<50	<40
C15-C28 fraction	<100	<100	<100
C29-C36 fraction	<50	<50	<100
C10-C36 fraction	<50	<50	ND
Benzene	<1	<1	<0.5
Toluene	<2	<2	<1
Ethylbenzene	<2	<2	<1
m&p-Xylene	<2	<2	<2
o-Xylene	<2	<2	<1
Total Xylene	ND	ND	ND
Lead	<0.001	<0.001	<0.005
Total PAHs	ND	ND	ND
Arsenic	0.006	0.005	0.0061
Cadmium	0.0003	0.0001	<0.002
Chromium	0.002	0.002	0.011
Copper	0.002	0.001	<0.005
Nickel	0.022	0.021	0.024
Zinc	0.054	0.025	0.026

LOCATION	MW04_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	ND
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	0.0002
Chromium	0.002
Copper	0.002
Nickel	0.007
Zinc	0.019

LOCATION	MW01_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.01
Total PAHs	ND
Arsenic	<0.01
Cadmium	<0.001
Chromium	<0.01
Copper	<0.02
Nickel	<0.01
Zinc	<0.05

LOCATION	MW05_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	0.0002
Chromium	0.003
Copper	0.002
Nickel	0.01
Zinc	0.022

LOCATION	MW02_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	100
C15-C28 fraction	500
C29-C36 fraction	130
C10-C36 fraction	730
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	1.6
Arsenic	0.02
Cadmium	<0.0001
Chromium	0.002
Copper	0.002
Nickel	0.03
Zinc	0.025

LOCATION	MW03_21/10/08
C6-C9 fraction	<20
C10-C14 fraction	<50
C15-C28 fraction	<100
C29-C36 fraction	<50
C10-C36 fraction	<50
Benzene	<1
Toluene	<2
Ethylbenzene	<2
m&p-Xylene	<2
o-Xylene	<2
Total Xylene	ND
Lead	<0.001
Total PAHs	ND
Arsenic	<0.001
Cadmium	0.0001
Chromium	0.003
Copper	0.002
Nickel	0.019
Zinc	0.028

LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- H — HYDRANT/WATER PIT
- G — GAS PIT
- S — SEWER PIT
- T — TELSTRA PIT
- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- 0.026 — Exceeds the Adopted Investigation Levels (ILs)

ND - Not Detected
QC100 - Field Duplicate
QC200 - Field Triplicate
Metals Concentrations are in mg/L
ALL other analytes concentrations are in µg/L

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

TITLE: **GROUNDWATER CONTAMINANT MAP**

A3

0 20 40
1:750 (metres)

DESIGNED: KY | DRAWN: BB | DATE: 25/11/08
APPROVED: NR | DATE: 25/11/08 | STATUS: DRAFT
PROJECT: 42424135 | CAD FILE: 005.DWG | REVISION: A

URS

FIGURE 5

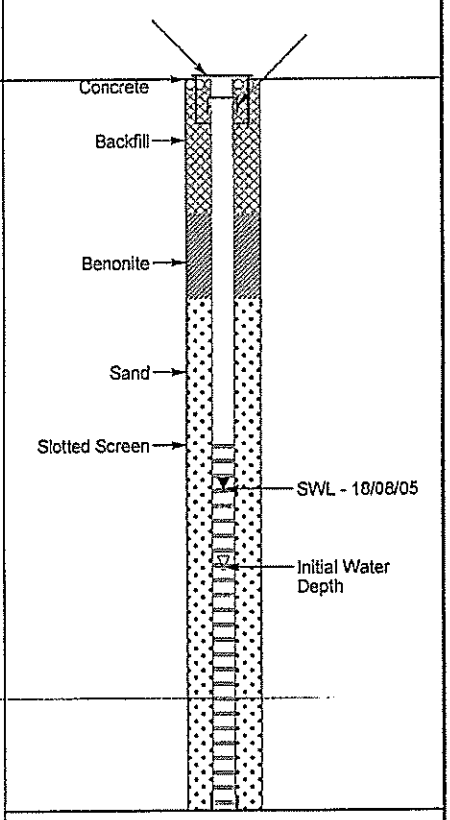
MONITORING WELL MW01

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie		Project Reference: Emoleum Depot Wetherill Park Project No.: 42423822	Client: Mobil Oil Australia Location: 24 Davis Road Wetherill Park
Logged By: KG and EC Checked By: Date Started: 21-07-05 Date Finished: 28-07-05	Bore Size: mm Total Depth: 8.00 m Casing Size: 50 mm	Relative Level: 36.58 mAHD Coordinates: 6253823.90 N 305636.20 E Permit No:	Drill Type: Down hole hammer Drill Medel: 1350 Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0	MW01_0.0-0.1		Sandy SILT: brown, roots, no odour, dry	SILT	0	D
	0	MW01_0.5-0.6		Silty CLAY: brown, dry, no odour	CL	1	D
	0	MW01_1.0-1.1		Air kinfed to 1.2m	CL	2	
	0	MW01_2.0-2.2		Silty CLAY: light brown, hard, contains shale gravels becoming shale, no odour	CL	3	
	0	MW01_3.0-3.2, QC109, QC209		Clayey SHALE: brown, hard, brittle, no odour	SHALE	4	
				CLAY: wet, too soft, clogs up chute (no sample were taken after this depth)	CL	5	
						6	
				EOH @ 6m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



MONITORING WELL MW02

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 28-07-05

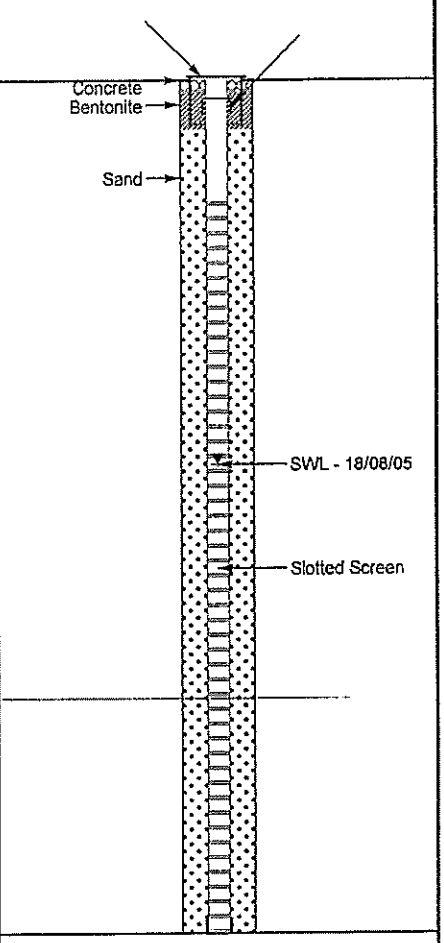
Bore Size: mm
Total Depth: 7.00 m
Casing Size: 50 mm

Relative Level: 37.09 mAHD
Coordinates: 6253826.60 N
305588.60 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW02_0.0-0.1		Sandy SILT: brown, roots, dry, no odour	SILT	0	D
	0	MW02_0.5-0.6		CLAY: brown, dry, no odour	CL		D
	0	MW02_1.0-1.1		Air Knifed to 1.2m	CL	1	
	0	MW02_2.0-2.2		CLAY: red/brown, fine grained, dry, no odour, low plasticity, shale gravels	CL	2	D
	0	MW02_3.0-3.2		Clayey SHALE: pale brown/grey, fine grained, no odour, shale gravels	SHALE	3	
	0	MW02_4.0-4.2		SHALE: grey shale with red clay parts, hard, brittle, no odour	SHALE	4	
				SHALE: grey, weathered, fine grained, gravels, no odour	SHALE	5	
				SHALE: pale grey, weathered small gravels, no odour	SHALE	6	
				EOH@7m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW03

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 01-08-05

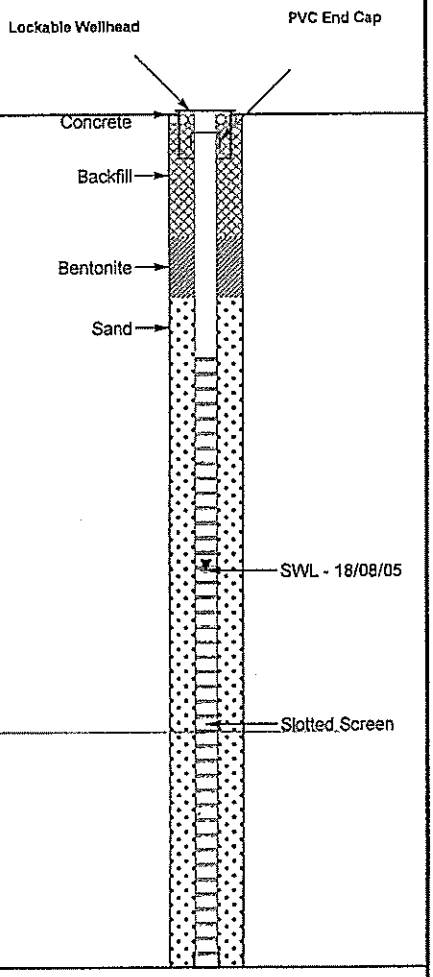
Bore Size: mm
Total Depth: 7.00 m
Casing Size: 50 mm

Relative Level: 37.88 mAHD
Coordinates: 6253847.70 N
305594.10 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0.1	MW03_0.0-0.1		SILT: brown, roots, dry, no odour	SILT	0	D
	0	MW03_0.5-0.6		Silty CLAY: brown, dry, no odour	CL-ML		D
	0	MW03_1.0-1.1		Air knifed to 1.2m Clayey SHALE: very fine grained, brown, dry, no odour	SHALE	1	D
	4.8	MW03_1.9-2.0				2	
				Shale gravels from 2.5m	SHALE		
	3.4	MW03_2.9-3.0				3	
	3.2	MW03_3.9-4.0		Weathered SHALE: very fine grained, dry, grey, no odour	SHALE	4	D
	1.9	MW03_4.9-5.0		brown from 4.8m, clayey, dry	SHALE	5	D
	1.7	MW03_5.9-6.0		SHALE: grey, gravels, angular, fine grained, no odour	SHALE	6	
	0.9	MW03_6.9-7.0		EOH@7m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW04

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 19-07-05
Date Finished: 28-07-05

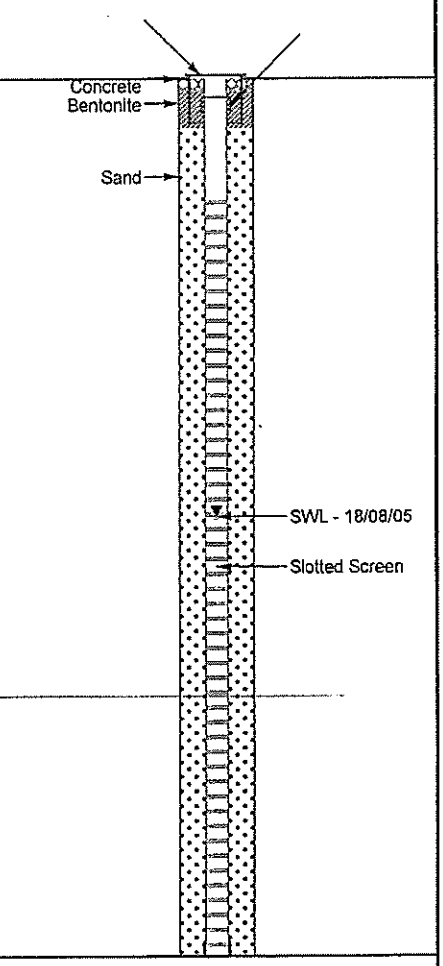
Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Relative Level: 39.09 mAHD
Coordinates: 6253879.60 N
305605.20 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW04_0.0-0.1		BITUMEN	ASPHALT	0	M
				Sandy CLAY: brown, moist, no odour	CLS		
	0	MW04_0.5-0.6		CLAY: light brown/grey, dry, no odour	CL		D
	0	MW04_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW04_2.0-2.2		Silty CLAY: red/brown, fine grained, dry, no odour, no gravels	CL-ML	2	D
	0	MW04_3.0-3.2		Clayey SHALE: light brown, fine grained, no odour, shale gravels, hard	SHALE	3	
	0	MW04_4.0-4.2		SHALE: weathered, grey, fine grained, no odour, shale gravels	SHALE	4	
	0	MW04_5.0-5.2		SHALE: grey/brown, fine grained, dry, no odour, fine gravels	SHALE	5	D
	0	MW04_6.0-6.2, QC111, QC211				6	
	0	MW04_7.0-7.2		SHALE: grey, soft, fine grained, weathered, no odour	SHALE	7	
				EOH @ 7.2 m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW05

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By:	KG and EC	Bore Size:	mm	Relative Level:	39.28 mAHD
Checked By:		Total Depth:	7.00 m	Coordinates:	6253879.80 N
Date Started:	19-07-05	Casing Size:	50 mm		305613.40 E
Date Finished:	28-07-05			Permit No:	

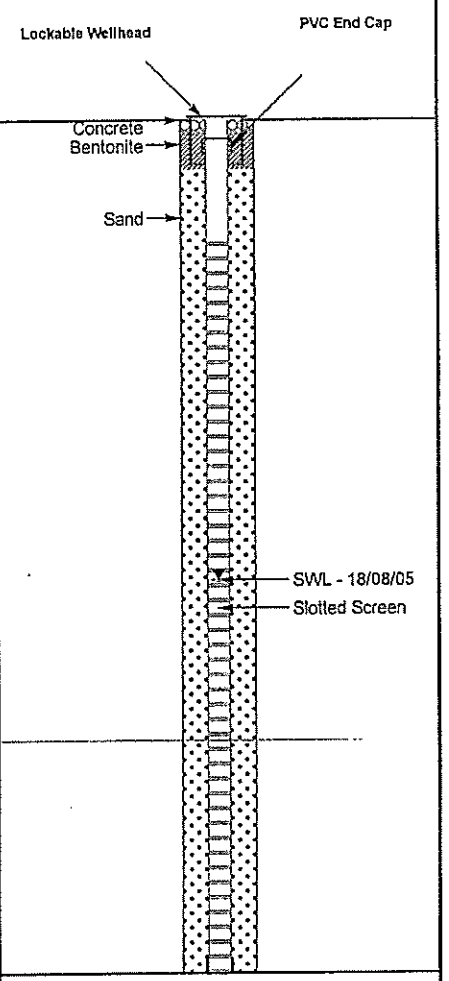
Drill Type: Down hole hammer

Drill Model: 1350

Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0.4	MW05_0.0-0.1, QAQC101, QAQC201		BITUMEN	ASPHALT	0	
				Gravely Sandy SILT: dark grey, moist, no odur	SILT		M
	0.2	MW05_0.5-0.6		CLAY: grey/brown, stiff, moist, no odour	CL		M
				CLAY: brown, stiff, dry, no odour	CL	1	D
	0.1	MW05_1.0-1.1		Air knifed to 1.2m	CL		
	0	MW05_2.0-2.2		Clayey SHALE: brown, dry, shale gravels, no odour	SHALE	2	D
	0	MW05_3.0-3.2				3	
	0	MW05_4.0-4.2		SHALE: weathered shale, silty clay, fine grained, no odour, no gravels	SHALE	4	
	0	MW05_5.0-5.2		SHALE: light brown, weathered, dry, no odour, no gravels	SHALE	5	D
	0	MW05_6.0-6.2				6	
				EOH @ 7.0m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW06

URS

URS Australia Pty. Ltd
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 19-07-05
Date Finished: 29-07-05

Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

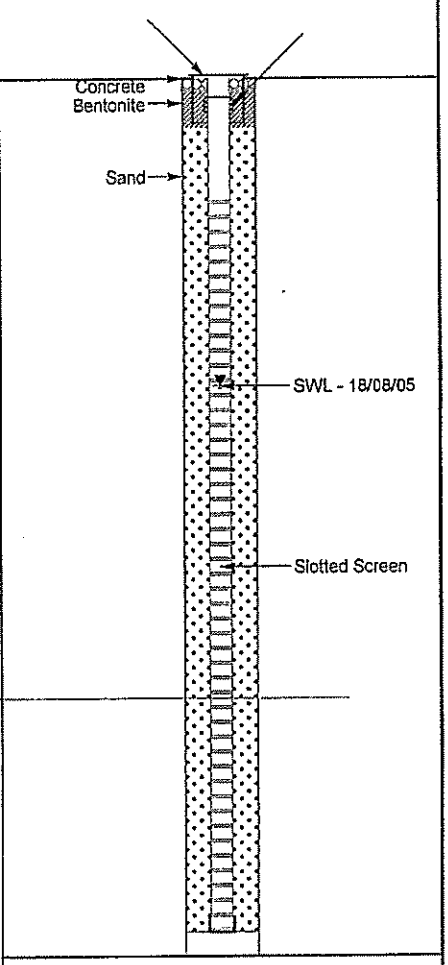
Relative Level: 39.39 mAHD
Coordinates: 6253909.00 N
305614.10 E
Permit No:

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW06_0.0-0.1		BITUMEN	ASPHALT	0	
				Gravely Silty SAND: dark grey, compact, no odour	SP		
	0	MW06_0.5-0.6		Silty CLAY: dark grey, compact/stiff, moist, no odour	CL-ML		M
	0	MW06_1.0-1.1		CLAY: grey, stiff, dry	CL	1	D
				Air knifed to 1.2m	CL		
	4.1	MW06_2.0-2.2		Clayey SHALE: light brown/grey, weathered, fine grained, no odour, shale gravels	SHALE	2	
	0.3	MW06_3.0-3.2		grey shale, gravels, hard		3	
	1.9	MW06_4.0-4.2		fine gravels		4	
	0	MW06_5.0-5.2		SHALE: soft, fine grained, no odour, shale gravels, powdery	SHALE	5	
	0	MW06_6.0-6.2		fine gravels, no odour	SHALE	6	
	0	MW06_7.0-7.2				7	
				EOH@7.2m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW07

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 29-07-05

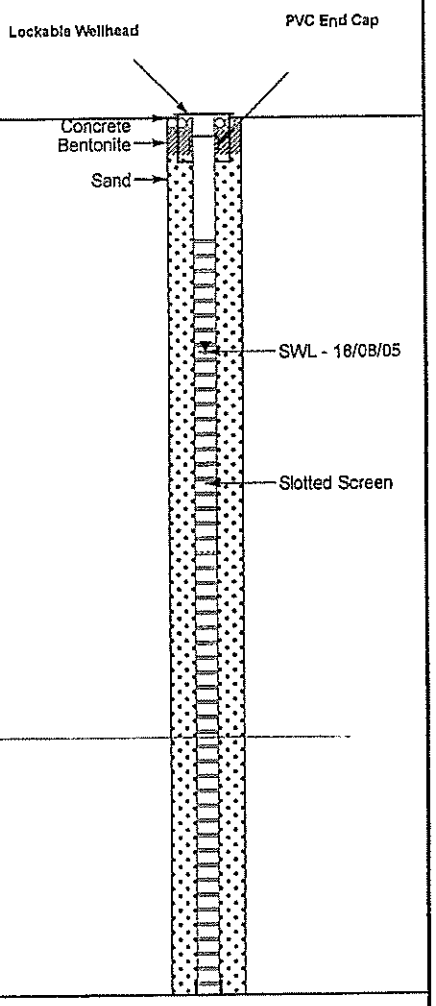
Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Relative Level: 39.34 mAHD
Coordinates: 6253922.60 N
305585.50 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW07_0.1-0.2		BITUMEN	ASPHALT	0	
				FILL: gravel, sand, roadbase, black	FILL		
	0	MW07_0.5-0.6		CLAY: dark grey, stiff, no odour	CL		
				CLAY: dark grey/brown, stiff, dry	CL	1	D
	0	MW07_1.0-1.1		Air knifed to 1.2m	CL		
	0	MW07_2.0-2.2		Clayey SHALE: medium brown clay, shale gravels, dry, no odour	SHALE	2	D
	0	MW07_3.0-3.2		fine gravels	SHALE	3	
	0	MW07_4.0-4.2		Weathered SHALE: pale brown, fine grained, sharp gravels, no odour, dry	SHALE	4	D
		MW07_5.0-5.2		SHALE: grey, powdery, fine grained, hard sharp gravels, no odour	SHALE	5	
		MW07_6.0-6.2		fine gravels	SHALE	6	
		MW07_7.0-7.2, QC113, QC213		powdery, grey, dry, no odour, no gravels	SHALE	7	D
				EOH@7.2m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW08

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 20-07-05
Date Finished: 01-08-05

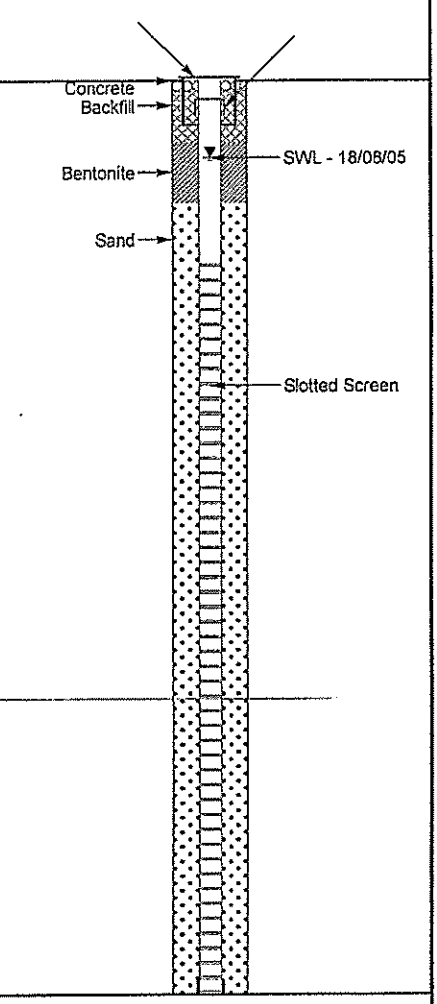
Bore Size: mm
Total Depth: 7.50 m
Casing Size: 50 mm

Relative Level: 43.50 mAHD
Coordinates: 6253960.90 N
305619.00 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
		MW08_0.1-0.2		Gravely SAND: dark grey, dry, no odour	SPG	0	D
		MW08_0.5-0.6		CLAY: light brown/brown, stiff, no odour, dry	CL		D
		MW08_1.0-1.1		CLAY: light brown/grey	CL	1	
				Air knifed to 1.2m			
				Clayey SHALE: grey, angular gravels, fine to medium grained, dry to moist, no odour	SHALE		D/M
	2.3	MW08_1.9-2.0				2	
				Brown from 2.5m			
	0.9	MW08_2.9-3.0				3	
	2.3	MW08_3.9-4.0		SHALE: angular gravels, grey/brown, dry, no odour	SHALE	4	D
	2.3	MW08_4.9-5.0				5	
	2.3	MW08_5.9-6.0		SHALE: angular gravels, fine grained, grey/brown, no odour	SHALE	6	
	2.9	MW08_7.4-7.5				7	
				EOH@7.5m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW09

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 20-07-05
Date Finished: 27-07-05

Bore Size: mm
Total Depth: 10.20 m
Casing Size: 50 mm

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

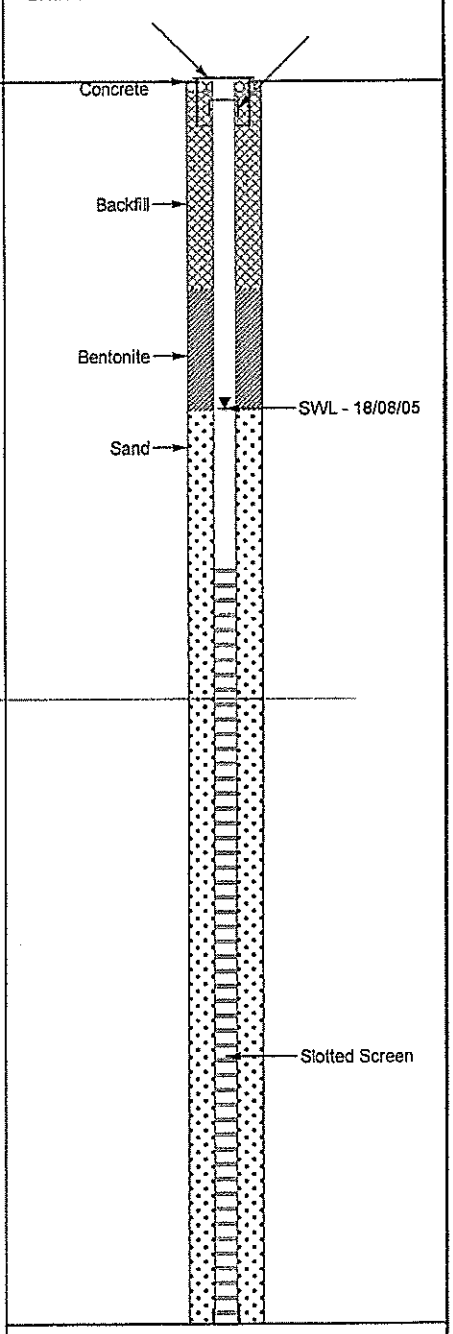
Relative Level: 45.67 mAHD
Coordinates: 6253976.70 N
305585.50 E
Permit No:

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
				BITUMEN	ASPHALT	0	
	0	MW09_0.5-0.6		FILL: sandy silt, brown, moist, no odour	FILL		M
	0	MW09_1.0-1.1		Air knifed to 1.2m	FILL	1	
	0	MW09_2.0-2.2		SHALE: dark brown, clay gravels, no odour	SHALE	2	
	0	MW09_3.0-3.2				3	
	0	MW09_4.0-4.2		SHALE: grey/brown, weathered clay/shale, large gravels, no odour	SHALE	4	
	0	MW09_5.0-5.2			SHALE	5	D
	0	MW09_6.0-6.2				6	
	0	MW09_7.0-7.2		SHALE: light grey, brittle, trace gravels, no odour	SHALE	7	
	0	MW09_8.0-8.2		SHALE: dark grey, fine grained, soft, no gravels, no odour	SHALE	8	
				SHALE: grey shale,weathered, dry, no odour	SHALE	9	D
	0	MW09_10.0-10.2				10	
				EOH @10.2 m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW10

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 20-07-05
Date Finished: 27-07-05

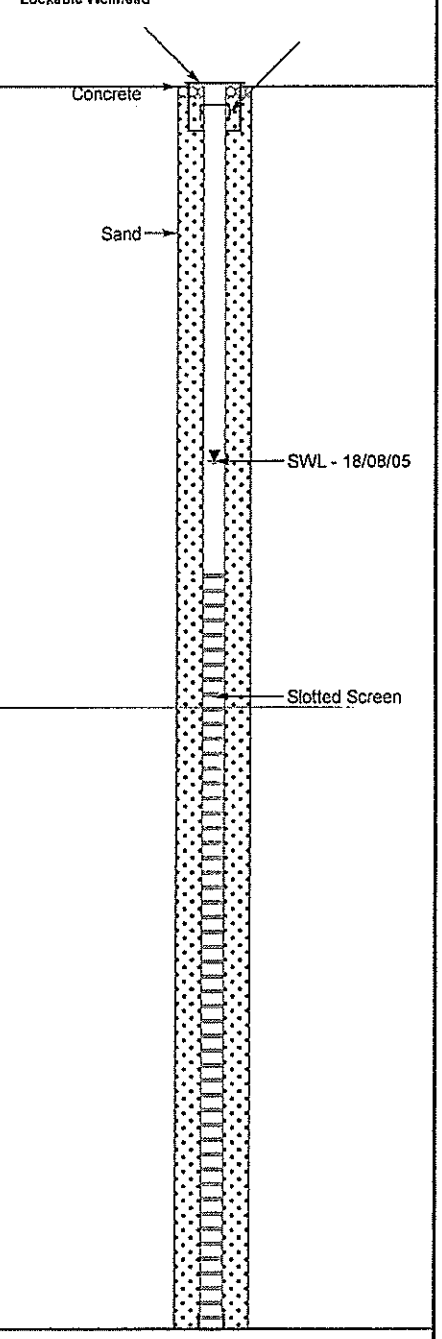
Bore Size: mm
Total Depth: 10.20 m
Casing Size: 50 mm

Relative Level: 46.14 mAHD
Coordinates: 6253978.40 N
305598.00 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0	MW10_0.2-0.3		CLAY: brown, moist, stiff, no odour	CL	0	
	0	MW10_0.5-0.6					
	0	MW10_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW10_2.0-2.2		SANDSTONE: small cobbles/gravel, mixed basalt/granite/sandstone fine grained dust.	SSTONE	2	
	0	MW10_3.0-3.2		Weathered SANDSTONE: sandy clay, brown/black, sharp angular gravels, no odour	SSTONE	3	
	0	MW10_4.0-4.2		SHALE: yellow/brown, soft, fine grained, trace gravels	SHALE	4	
	0	MW10_5.0-5.2		SHALE: weathered, brown, fine grained, some gravels, no odour	SHALE	5	
	0	MW10_6.0-6.2				6	
	0	MW10_7.0-7.2, QC106, QC206		powdery talc, trace small gravel	SHALE	7	
	0	MW10_8.0-8.2		SHALE: Medium brown, fine grained talc, dry, no odour, no gravel	SHALE	8	D
				SHALE: pale grey, soft, powder, no gravels, no odour	SHALE	9	
	0	MW10_10.0-10.2				10	
				EOH @ 10.2 m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW11

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 27-07-05

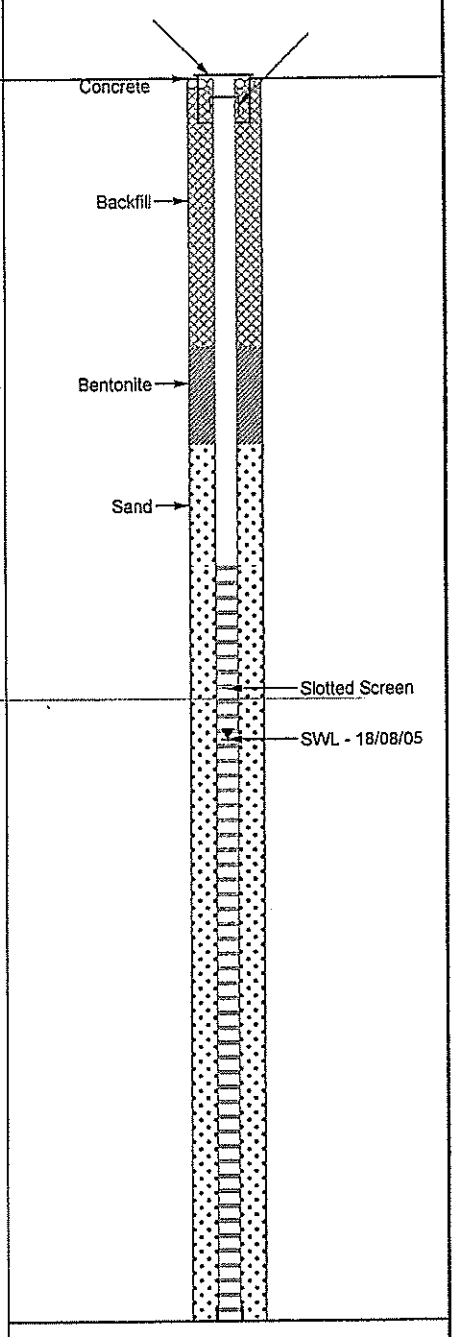
Bore Size: mm
Total Depth: 10.20 m
Casing Size: 50 mm

Relative Level: 46.92 mAHD
Coordinates: 6253982.30 N
305629.60 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
				CONCRETE	CNCRET	0	
	0	MW11_0.1-0.2, QAQC104, QAQC204		CLAY: brown, moist, stiff, no odour	CL		
	0	MW11_0.5-0.6		Silty CLAY: orange/brown, moist, stiff, no odour	CL		M
	0	MW11_1.0-1.1		Silty CLAY: light brown/brown, dry, stiff,	CL	1	D
				Air knifed to 1.2m	CL		
	0	MW11_2.0-2.2		SHALE: light brown, fine dust, gravels, dry, no odour	SHALE	2	D
	0	MW11_3.0-3.2		fine grained, silty clay, gravels, no odour		3	
	0	MW11_4.0-4.2		weathered, fine grained, dusty		4	
	0	MW11_5.0-5.2		no gravels		5	
	0	MW11_6.0-6.2		fill, dusty silty clay, light brown, dry, no odour, contains gravels		6	D
	0	MW11_7.0-7.2		white/grey, more small gravels		7	
	0	MW11_8.0-8.2		medium brown, fine grained, gravels		8	
				fine grained, talc powder, no odour		9	
	0	MW11_10.0-10.2				10	
				EOH @ 10.2 m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW12

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 22-07-05

Bore Size: mm
Total Depth: 10.00 m
Casing Size: 50 mm

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

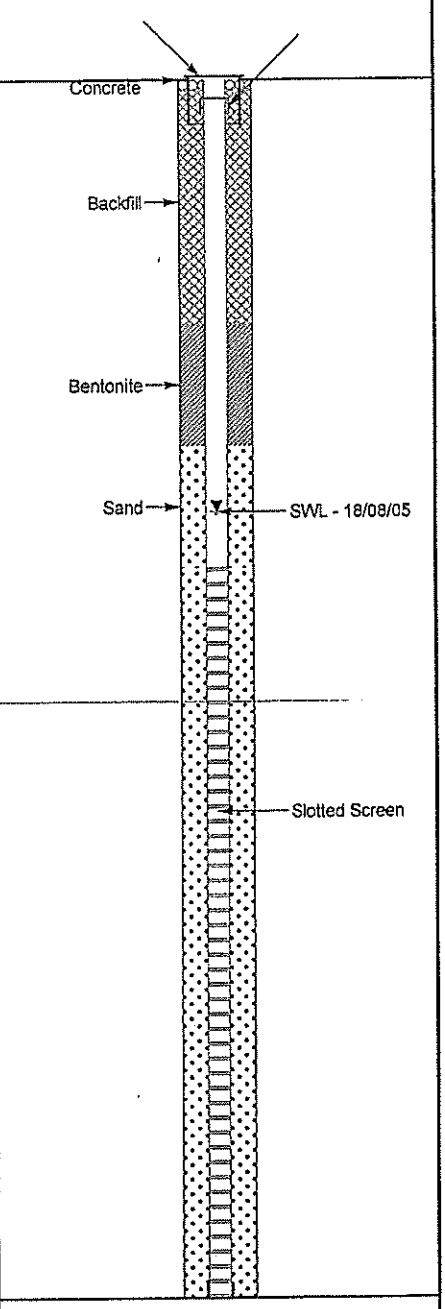
Relative Level: 46.49 mAHD
Coordinates: 6254015.20 N
305568.40 E
Permit No:

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW12_0.1-0.2		BITUMEN	ASPHALT	0	M
				FILL: gravel silt, brown, moist no odour	FILL		
	0.1	MW12_0.5-0.6		FILL: gravel brown, dry, no odour	FILL		D
				FILL: Silty Clay, light brownt dry, no odour	FILL	1	D
	0.1	MW12_1.0-1.1		Air knifed to 1.2m	FILL		
				FILL: clay/slag/silt/gravel/sandstone, fine grained, red/brown/black, dry	FILL		D
	0	MW12_1.9-2.1				2	
				Clayey gravely SILT: fine grained, dry clay clasts, gravels to 5mm, brown, no odour	SILT		D
	0.5	MW12_2.9-3.0				3	
						4	
	0.4	MW12_4.9-5.0				5	
				Weathered SILTSTONE: Very fine grained, brown, dry, clayey	SILTSTONE		D
	0.8	MW12_5.9-6.0				6	
	0.3	MW12_6.9-7.0				7	
				SHALE: grey, dry, weathered	SHALE		D
	1.1	MW12_7.9-8.0				8	
	0.5	MW12_8.9-9.0				9	
	0.3	MW12_9.9-10.0				10	
				EOH@10m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW13

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 26-07-05

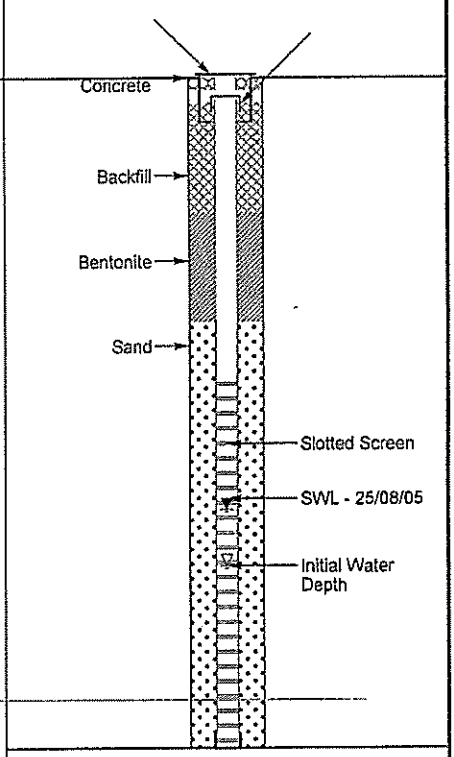
Bore Size: mm
Total Depth: 5.50 m
Casing Size: 50 mm

Relative Level: 46.75 mAHD
Coordinates: 6254032.40 N
305586.00 E
Permit No:

Drill Type: Solid stem auger
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW13_0.1-0.2		GRAVEL/BITUMEN	ASPHALT	0	D
				FILL:gravel, sand, silt, black, dry, no odour	FILL		
	0	MW13_0.5-0.6		Silty CLAY: light brown/ brown, no odor, dry ,stiff	CL		D
	0	MW13_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW13_2.0-2.2		Silty CLAY: orange, dry/moist, low plasticity, hard, gravels, no odour	CL	2	D/M
	0	MW13_3.0-3.2		Sandy CLAY: orange, dry/moist, low plasticity, large granite gravels	CL	3	D/M
	0	MW13_4.0-4.2		Silty CLAY: orange, dry/moist, low plasticity, loose, fine grained, gravels, water table struck	CL	4	D/M
				EOH@5.5m		5	
						6	
						7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS

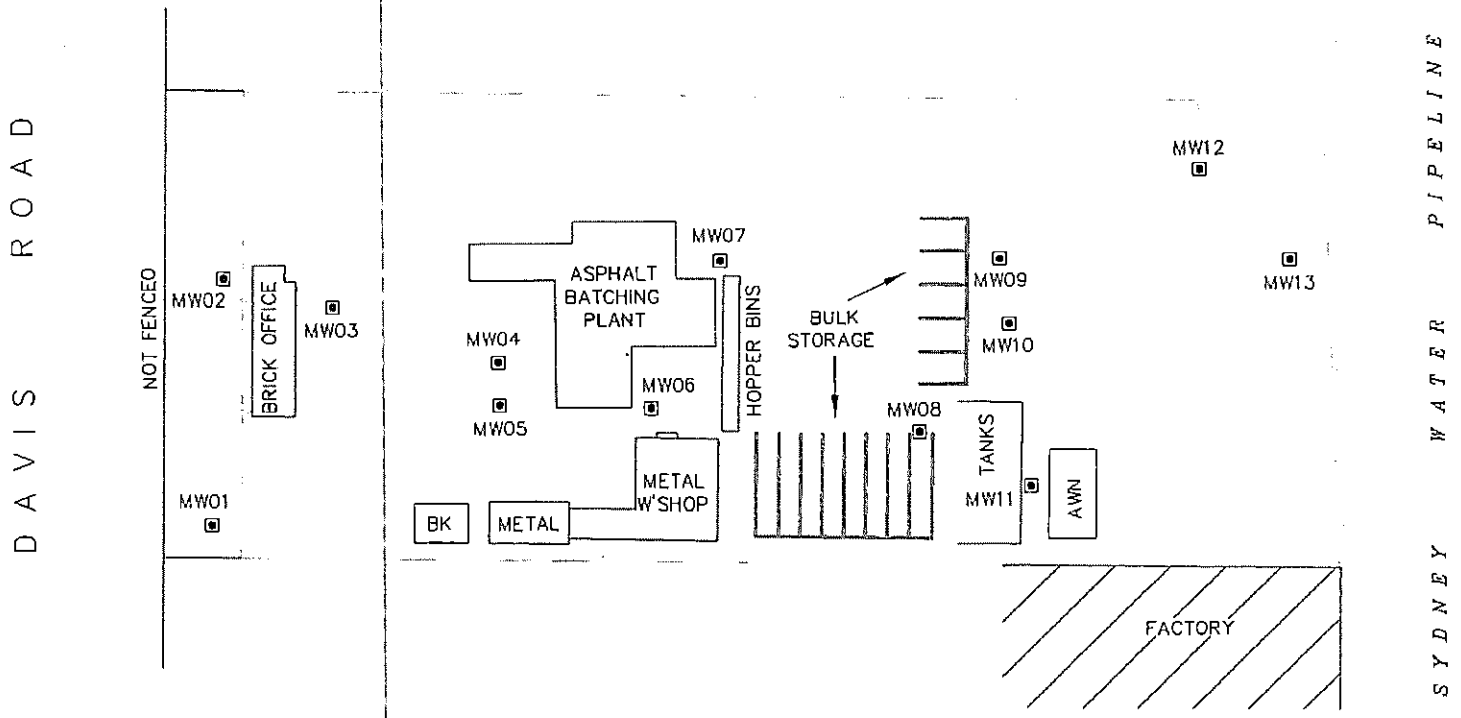


WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

	AMG COORDINATES		AHD HEIGHTS	
Pt No.	Easting	Northing	Top Of Pipe	Cover Plate
MW01	305636.2	6253823.9	36.50	36.58
MW02	305588.6	6253826.6	36.97	37.09
MW03	305594.1	6253847.7	37.79	37.88
MW04	305605.2	6253879.6	39.01	39.09
MW05	305613.4	6253879.8	39.20	39.28
MW06	305614.1	6253909.0	39.31	39.39
MW07	305585.5	6253922.6	39.26	39.34
MW08	305619.0	6253960.9	43.43	43.50
MW09	305585.5	6253976.7	45.57	45.67
MW10	305598.0	6253978.4	46.02	46.14
MW11	305629.6	6253982.3	46.84	46.92
MW12	305568.4	6254015.2	46.38	46.49
MW13	305586.0	6254032.4	46.65	46.75

AMG

NOTE: FENCING & EDGING IS SHOWN FOR ORIENTATION PURPOSES ONLY AND DOES NOT DEFINE BOUNDARIES



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PLAN SHOWING POSITION & HEIGHTS OF MONITORING WELL SITES AT
24 DAVIS ROAD
WETHERILL PARK

A3
1:1000
units=metres

ORIGIN OF COORDS: SSM 42224 & SSM 75573
GRID: AUSTRALIAN MAP GRID (AMG)

ORIGIN OF HEIGHTS: SSM 44159 (RL 51.143)
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)

INSTRUMENT: LEICA TC 1010 TOTAL STATION

SURVEYOR REGISTERED UNDER THE SURVEYING ACT, 2002

OUR REFERENCE: 9406 SURVEY DATE: 18/8/05

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW01

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	11:00	11:15
Bore Depth (mbTOC)	6.01	6.03
- SWL (mbTOC)	3.31	dry
2.70 x L/m	4	
= Bore Vol	11 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:29	
Bore Depth (mbTOC)	6.00	
- SWL (mbTOC)	3.36	DRY
x L/m	2.64	
= Bore Vol	11 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1:37	10		3.60	11.16mS	7.15	237	20.5	Brown; mod Turb.	0	0	0	0
	20	3.79 ppm	[illegible]	5.14mS	6.81	236	20.0	" "				
12:15	Sample		5.74	1037	6.90	222	19.0	Turbid; Brown				

14/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	12:02	
SWL	3.36	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW01 - 19/8/05	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW02

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	11:15	
Bore Depth (mbTOC)	6.75	
- SWL (mbTOC)	3.07	dry
3.68 x L/m	4	
= Bore Vol	15	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 10L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GRS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:50p	
Bore Depth (mbTOC)	6.75	
- SWL (mbTOC)	3.15	DRY
x L/m	3.6	
= Bore Vol	15L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
2:00	10L		3.74	8.98mS	7.23	211	21.9	Clear to Slight Turbidity	0	0	0	0
1:00	Sample		4.83	1062	6.99	235	20.1	Cloudy.				

19/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	1:00	
SWL	4.80	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	Container type and size									
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW02-19/8/05	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

Confidential – Subject to Legal Professional Privilege

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW03

Project No 51556- Project Name CSR Location W. Pad

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:40	10:50
Bore Depth (mbTOC)	6.70	6.73
- SWL (mbTOC)	3.70	Dry.
3 x L/m	4	
= Bore Vol	12 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 11L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:13	
Bore Depth (mbTOC)	6.7	
- SWL (mbTOC)	3.74	
x L/m	3	
= Bore Vol	12 L.	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level None mbTOC
Comments Dry @ 10L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1:20	10L		3.07	23.82mS	6.97	227	21.9	Slight Turbid Brown	0	0	0	0
19/8/05 11:56	Sample		3.86	979µS	6.99	222	20.1	Clear ; to Slightly Turbid				

Sampling

Date 18 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	1:45	
SWL		

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW03_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW04

Project No 51556- Project Name CSR Location Wo Park

Development

Date 10 / 8 / 05
Developed by: En'n
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9.50	
Bore Depth (mbTOC)	6.81	
- SWL (mbTOC)	3.49	
3.32 x L/m	4	
= Bore Vol	12	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 15L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								brown, silty. no odour				

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	2:45	
Bore Depth (mbTOC)	6.81	
- SWL (mbTOC)	3.585	DRY
x L/m	3.222	
= Bore Vol	13L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 13L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
2:54	10		21.67	2146µs	6.96	223	22.8	Brown Turbid	0	0	0	0
19/8/05 11:35	Sample		3.36	959	6.74	224	21.5	Brown Turb.				

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	12:10	
SWL	3.64	

Container type and size

	Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
		2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
		H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
		Maroon	Yellow	Red	White	Green	White	White	White		
Primary	MW04-19/8/05	2	1	1	1		1	1	1		8
Duplicate	04 QC01	2	1	1	1		1	1	1		8
Triplicate	QC02	2	1	1	1		1	1	1		8

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW05

Project No 51556- Project Name Location

Development

Date 10/8/05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:05	10:15
Bore Depth (mbTOC)	6.78	
- SWL (mbTOC)	3.63	Dry.
3.15 x L/m	4	
= Bore Vol	12	

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 13L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
								brown, turbid, no odour

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18/8/05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	2:32	
Bore Depth (mbTOC)	6.78	
- SWL (mbTOC)	3.77	10L
x L/m		
= Bore Vol	12L	

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 10L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
~~Read~~ 2:37	10L		1.88ppm	948	6.98	232	24.6	Brown & Turbid
19/8/05 1100	Sample		3.28	1022	6.78	225	21.7	Brown Turbid

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

Sampling

Date 19/8/05
Sampled by:
Sampling Method: Bailer / Other

	Start	End
Time	10:55	
SWL	3.95	

Container type and size

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW05_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW06

Project No 51556- Project Name CSR Enderm Location @ Wetherill Park

Development

Date 10/8/05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9.30	9.40
Bore Depth (mbTOC)	6.84	6.85
- SWL (mbTOC)	2.44	Dry
4.40 x L/m		
= Bore Vol	18L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
								brown, turbid no odour grey-

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

MW08

Date 18/8/05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:10	
Bore Depth (mbTOC)	7:00	
- SWL (mbTOC)	0.63	DRY
x L/m	6.37	
= Bore Vol	26L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 30L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
3:25	20L		5.39	1216	7.75	189	20	Brown Slight Turbid
	30L		3.82	1381	7.46	201	20.5	
10:45	Sample		3.29	1005	6.88	216	19.3	Grey Brown Slightly turbid

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

MW06 19/8/05

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:45	
SWL	2.59	

Container type and size

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	HCl/SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW06_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW07

Project No 51556- Project Name ESR Emeraude Park Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9am	9.10
Bore Depth (mbTOC)	6.73	6.75
- SWL (mbTOC)	1.76	Dry
4.97 x L/m	20L	
= Bore Vol	20L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry at 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
								grey - brown, turbid, no odour

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
	0	-	

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	12:30	
Bore Depth (mbTOC)	6.73	
- SWL (mbTOC)	1.92	DRY
x L/m	4.78	
= Bore Vol	20L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
12:35	10		2.81	12.11mS	6.97	241	18.8	Cloudy, Slightly Turbid
12:40	20		2.88	12.69mS	7.13	244	19.3	
10:35 (19/8/05)	Sample		4.91	1016µS	6.92	224	19.1	Clear, Slight Turb.

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:25	
SWL	3.21	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW07	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW06 MW08

Project No 51556- Project Name CSL Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: Damaged destroyed. well cover removed

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time		
Bore Depth (mbTOC)	7.00	
- SWL (mbTOC)	0.63	
x L/m		
= Bore Vol		

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 32L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

MW06

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	(4)	9

	Start	End
Time	2:05pm	
Bore Depth (mbTOC)	7.00	
- SWL (mbTOC)	2.52	DRY
x L/m	4.48	
= Bore Vol	18L	

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
2:19	15L		1.57	8Hl/uS	7.06	72.1	24.2	Brown High turbidity.
1:20	Sample		4.72	1269	7.46	114.9	16.6	Clear

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

MW08 19/1/05

Sampling

Date 19 / 8 / 05
Sampled by:

Sampling Method: Bailer / Other

	Start	End
Time	1:20	
SWL	0.98	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCDP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW08_19/1/05	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW09

Project No 51556- Project Name CSR Location W. Park

Development

Date 9/8/05
Developed by: EAN
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:50	
Bore Depth (mbTOC)	10.08	
- SWL (mbTOC)	2.63	DRY
7.45 x L/m	4	
= Bore Vol	34L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 50L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18/8/05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	(4)	9

	Start	End
Time	10:25	
Bore Depth (mbTOC)	10.00	
- SWL (mbTOC)	2.68	DRY
x L/m	7.32	
= Bore Vol	30L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 40L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
10:30	20	~~Good~~	6.06	1827	7.05	211	19.7	Turbid Grey Brown	0	0	0	0
10:40	40L		5.11	4.61mS	7.19	225	19.7	Turbid Grey Brown	0	0	0	0
10:5	Sample		6.71	874	7.23	173	20.3	Clear / Slightly Cloudy	~~0~~	~~0~~	—	—

19/8/05

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:05	
SWL	2.69	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW09-19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW10

Project No 51556- Project Name CSR Emoleum Location Westmoreland Park

Development

Date 9/8/05
Developed by: Erin
Well head condition: New -

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:20	
Bore Depth (mbTOC)	9.71	
- SWL (mbTOC)	3.03	DRY
6.68 x L/m	26	
= Bore Vol	26	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 20L. Bailer dropped in well - not yet retrieved !!

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18/8/05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:49	
Bore Depth (mbTOC)	9.70	
- SWL (mbTOC)	3.065	DRY
x L/m	6.635	
= Bore Vol	27L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments & retrieved lost Bailer !! Dry @ 25L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
11:05	10L		6.55	2.65mS	7.26	206	20.1	V. Turbid / Brown
	20		3.52	2.57mS	7.20	211	20.1	" "
19/8/05 10:00	Sample		6.02	1226µS	7.27	180	21.4	Turbid / Sl cloudy

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:55	
SWL	4.61m	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	+ H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW10-19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW11

Project No 51556- Project Name CSR Emoleum Location Wetherill Park

Development

Date 9/8/05
Developed by: Erin
Well head condition: new.

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3.00	3.05
Bore Depth (mbTOC)	9.75	9.75
- SWL (mbTOC)	4.91	DRY
4.84 x L/m	4	
= Bore Vol	20	

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed ~~8~~ 5 L/min
PSH Level mbTOC
Comments: Dry @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								grey silty, no odour.				

Purging

Date 18/8/05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	11:25	
Bore Depth (mbTOC)	9.75	
- SWL (mbTOC)	5.42	DRY
x L/m	4.73	
= Bore Vol	17.32	

Development Method: Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments: Dry @ 15L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
~~11:32~~	~~5L~~	~~5128~~	~~5.10~~	~~7.01~~	~~258~~							
	10		5.28	5.10	7.01	258	19.7	slightly Turbid / Grey.	0	0	0	0
	15L		4.99	6.13	6.88	236	19.5	Turbid / Grey				
19/8/05 9:44	sample		2.09	1238	6.79	217	19.6	Slight Turbid / Grey				

Sampling

Date 19/8/05
Sampled by:
Sampling Method: Bailer / Other

	Start	End
Time	9:44	
SWL		

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW11_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW12

Project No 51556- Project Name CSR Emoleum Location Wetherill Park

Development

Date 9/8/05
Developed by: ENN
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1.30	1.32
Bore Depth (mbTOC)	9.79	
- SWL (mbTOC)	3.36	DRY.
6.43 x L/m	25	
= Bore Vol	25	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 30L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								light brown, turbid, no odour				

Purging

Date 8/8/05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9:40	10:15
Bore Depth (mbTOC)	9.70	
- SWL (mbTOC)	3.535	DRY
x L/m	6.165	
= Bore Vol	25 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level None mbTOC
Comments Dry @ 30L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1000	10		3.28	1167	6.26	282	19.11	Sl Turbid Grey Brown	0	0	0	0
10:10	20		3.14	1112	6.65	246	20.6	Turbid, Grey Brown				
10:15	30		2.96	1167	6.82	231	19.5	V. Turbid, Brown				
9:28	sample		5.89	1233	7.14	211	20.00	Turbid ; Brown				

19/8/05

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	9:28	
SWL		

Sample ID	Container type and size	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
		2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
		H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
		Maroon	Yellow	Red	White	Green	White	White	White		
Primary	MW12-19/8/05	✓	✓	✓	✓		✓	✓	✓		16
Duplicate	Xtra Volume for lab QC										
Triplicate											

Comments

Table 3: Well Construction and Groundwater Gauging Summary
Mobil Oil Australia Pty Ltd
Mobil - Wetherill Park
Job Numer: 42424444

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH Thickness (m)	Depth of Screen Top mbgl	Depth of Screen Top mAHD	Depth of Screen Bottom mbgl	Screen Length m	lithology
MW01	26/06/2012	6.01	36.50	2.79	33.71	0.00	3.00	33.50	6.00	3.00	clayey shale
MW02	26/06/2012	6.50	36.97	2.33	34.64	0.00	1.00	35.97	7.00	6.00	clay and clayey shale, shale
MW03	26/06/2012	6.69	37.79	3.00	34.79	0.00	2.00	35.79	7.00	5.00	clayey shale
MW04	26/06/2012	6.81	39.01	2.96	36.05	0.00	1.00	38.01	7.20	6.20	clay and clayey shale, shale
MW05	26/06/2012	6.70	39.20	3.07	36.13	0.00	1.00	38.20	7.00	6.00	clay and then a clayey shale and shale
MW06	26/06/2012	6.84	39.31	2.02	37.29	0.00	1.00	38.31	7.00	6.00	clay and then a clayey shale and shale
MW07	26/06/2012	6.70	39.26	1.35	37.91	0.00	1.00	38.26	7.20	6.20	clay and then a clayey shale and shale
MW08	26/06/2012	7.00	43.43	0.15	43.28	0.00	1.50	41.93	7.50	6.00	clayey shale and shale
MW09	26/06/2012	10.00	45.57	1.93	43.65	0.00	4.00	41.57	10.20	6.20	shale
MW10	26/06/2012	9.69	46.02	2.51	43.51	0.00	4.00	42.02	10.20	6.20	shale
MW11	26/06/2012	9.73	46.84	2.87	43.97	0.00	4.00	42.84	10.20	6.20	shale
MW12	26/06/2012	9.70	46.38	2.74	43.64	0.00	4.00	42.38	10.00	6.00	clayey gravelly silt, weathered siltstone, shale
MW13	26/06/2012	5.18	46.65	2.41	44.25	0.00	2.50	44.15	5.50	3.00	silty clay, sandy clay

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum

Table 4: Groundwater Field Parameters
Mobil Oil Australia Pty Ltd
Mobil - Wetherill Park
Job Numer: 42424444

Well ID	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	26/06/2012	35574	21344	6.56	0.44	18.8	232	Clear.
MW02	27/06/2012	18218	10931	6.61	3.30	19.7	229	Clear. Purged dry after 17L
MW03	27/06/2012	20080	12048	6.54	1.30	20.5	233	Clear, slightly turbid. Purged dry after 16L
MW04	26/06/2012	21198	12719	6.47	0.94	22.7	237	Clear, slightly turbid.
MW05	27/06/2012	20697	12418	6.58	1.38	23.4	231	Clear, slightly turbid. Purged dry after 15L
MW06	27/06/2012	21563	12938	6.69	2.61	22.2	225	Clear, slightly turbid. Purged dry after 18L
MW07	27/06/2012	20246	12148	6.80	4.50	20.4	218	Clear, slightly turbid. Purged dry after 7L
MW08	27/06/2012	1575	945	7.52	6.77	19.6	172	Grey, turbid. Purged dry after 35L
MW09	27/06/2012	1167	700	7.16	5.26	21.5	198	Grey, silty.
MW10	27/06/2012	2081	1249	7.19	6.12	21.7	197	Brown, turbid. Purged dry after 25L
MW11	27/06/2012	4642	2785	7.05	7.34	20.3	206	Grey turbid. Purged dry after 20L
MW12	27/06/2012	6998	4199	6.55	0.40	22.0	228	Brown, turbid.
MW13	27/06/2012	1400	840	7.03	0.49	20.4	206	Clear, turbid.

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
Temp - Temperature

Table 1
Well Construction and Groundwater Gauging Summary
Former Emoleum Wetherill Park GME 2010

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH [4] Thickness (m)
MW01	16/03/2010	6.00	36.50	3.07	33.43	ND
MW02	16/03/2010	6.50	36.97	2.68	34.29	ND
MW03	16/03/2010	6.70	37.79	3.30	34.49	ND
MW04	16/03/2010	6.80	39.01	2.86	36.15	ND
MW05	16/03/2010	6.70	39.20	3.03	36.17	ND
MW06	16/03/2010	7.00	39.31	2.03	37.28	ND
MW07	16/03/2010	6.70	39.26	0.64	38.62	ND
MW08	16/03/2010	7.00	43.43	0.47	42.96	ND
MW09	16/03/2010	10.00	45.57	2.34	43.23	ND
MW10	16/03/2010	9.70	46.02	2.72	43.30	ND
MW11	16/03/2010	9.75	46.84	3.23	43.61	ND
MW12	16/03/2010	9.70	46.38	3.15	43.23	ND
MW13	16/03/2010	5.17	46.65	3.14	43.51	ND

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. mAHD - metres Australian Height Datum
4. PSH - Phase Seperated Hydrocarbons

ND - Not Detected

Table 2
Groundwater Field Parameters
Former Emoleum Wetherill Park GME 2010

Well ID	Date	Electrical Conductivity uS/cm	Total Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	16/03/2010	31900	19140	6.93	5.09	20.3	299	Yellowish brown, slightly turbid, no odour or sheen. Dry after 36 L.
MW02	17/03/2010	23861	14317	7.15	0.86	21.1	160	Black, slightly turbid, organic odour. 16/03/10 Well was blocked by tree roots and only 3L of water was purged out. 17/03/10 Unblocked and purged dry after 10 L.
MW03	16/03/2010	18789	11273	7.02	2.68	21.8	223	Grey, clear, dry after 13L.
MW04	16/03/2010	20926	12556	6.77	3.34	24.4	272	Yellowish brown, turbid, no odour or sheen. Dry after 16L.
MW05	16/03/2010	19094	11456	6.85	2.65	24.3	256	Yellowish brown, turbid, no odour or sheen. Dry after 12L.
MW06	16/03/2010	15491	9295	7.05	2.90	22.9	210	Dark brown, slightly turbid, no odour or sheen. Dry after 20L.
MW07	16/03/2010	18752	11251	6.89	3.41	22.2	235	Dark brown, slightly turbid, no odour or sheen. Dry after 28L.
MW08	16/03/2010	6899	4139	7.49	3.26	21.7	268	Brown-grey, trubid, no odour or sheen. Dry after 35L.
MW09	16/03/2010	1704	1022	7.50	3.85	22.5	299	Dark brown, turbid, no odour or sheen. Dry after 30L.
MW10	16/03/2010	7985	4791	7.29	3.82	22.2	311	Slighlty dark brown, turbid, no odour or sheen. Dry after 26L.
MW11	16/03/2010	4973	2984	7.27	3.90	20.7	282	Light brown, slightly turbid, no odour or sheen. Dry after 22L.
MW12	16/03/2010	6532	3919	6.83	3.54	23.0	307	Yellowish brown, turbid, no odour or sheen. Dry after 30L.
MW13	16/03/2010	1420	852	7.28	2.90	23.1	296	Yelowish brown, slightly turbid, no odour or sheen.

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved oxygen
Temp - Temperature
uS/cm - Microsiemens per centimetre
ppm - Parts per million
mV - Millivolts
°C - Celsius degree

Table 1
Well Construction and Groundwater Gauging Summary
Former Emoleum Wetherill Park GME 2008

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH Thickness (m)
MW01	21/10/2008	6.00	36.50	3.03	33.47	nil
MW02	21/10/2008	6.50	36.97	2.65	34.32	nil
MW03	21/10/2008	6.70	37.79	3.34	34.45	nil
MW04	21/10/2008	6.80	39.01	3.01	36.00	nil
MW05	21/10/2008	6.70	39.20	3.15	36.05	nil
MW06	21/10/2008	7.00	39.31	1.98	37.33	nil
MW07	21/10/2008	6.70	39.26	1.23	38.03	nil
MW08	21/10/2008	7.00	43.43	0.21	43.22	nil
MW09	21/10/2008	10.00	45.57	2.13	43.44	nil
MW10	21/10/2008	9.70	46.02	2.72	43.30	nil
MW11	21/10/2008	9.75	46.84	2.97	43.87	nil
MW12	21/10/2008	9.70	46.38	2.70	43.68	nil
MW13	21/10/2008	5.17	46.65	2.97	43.68	nil

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum

Table 2
Groundwater Field Parameters
Former Emoleum Wetherill Park GME 2008

Well ID	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	21/10/2008	36300	21780	6.77	5.36	18.6	392	Brown, turbid
MW02	21/10/2008	14920	8952	6.87	0.67	18.3	133	Grey, thick, turbid
MW03	21/10/2008	23000	13800	7.01	2.65	19.9	197	Brown, turbid
MW04	21/10/2008	20190	12114	6.84	9.17	21.4	281	Brown/grey, turbid
MW05	21/10/2008	19810	11886	6.93	3.71	21.4	283	Brown, turbid
MW06	21/10/2008	14680	8808	7.44	5.38	19.7	249	Brown/grey, turbid
MW07	21/10/2008	20660	12396	7.01	3.25	19.3	212	Light brown/grey
MW08	21/10/2008	5710	3426	7.27	3.64	19.3	363	Grey, turbid
MW09	21/10/2008	3130	1878	7.16	3.61	21.2	322	Grey, silty
MW10	21/10/2008	10070	6042	7.11	4.43	21.1	295	Grey/brown, turbid
MW11	21/10/2008	6990	4194	7.01	4.46	19.9	389	Grey/brown, turbid
MW12	21/10/2008	6120	3672	6.91	3.79	21.2	427	Brown, turbid, dry after 25L
MW13	21/10/2008	1562	937	7.53	3.82	18.3	366	Brown, turbid

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
Temp - Temperature

Table 6
Groundwater Gauging Summary
Mobil Emoleum Wetherill Park P2 ESA

WELL ID	Total Depth (mTOC [2])	SWL [1] (mTOC [2])	TOC (mAHD [3])	SWL (mAHD)	PSH (m)
MW01	6.00	3.36	36.50	33.14	nil
MW02	6.75	3.15	36.97	33.82	nil
MW03	6.70	3.74	37.79	34.05	nil
MW04	6.81	3.59	39.01	35.42	nil
MW05	6.78	3.77	39.20	35.43	nil
MW06	7.00	2.52	39.31	36.79	nil
MW07	6.73	1.92	39.26	37.34	nil
MW08	7.00	0.63	43.43	42.80	nil
MW09	10.08	2.68	45.57	42.89	nil
MW10	9.71	3.07	46.02	42.95	nil
MW11	9.75	5.42	46.84	41.42	nil
MW12	9.79	3.54	46.38	42.85	nil
MW13*	5.10	3.45	46.65	43.20	nil

Notes:
1. SWL - Static Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum
* Data collected on 25 August 2005

Table 7
Groundwater Water Quality Parameters
Mobil Emoleum Wetherill Park P2 ESA

	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp `C	Redox Potential (Eh) [2] mV	Description
MW01	18/08/2005	5140	3084	6.81	3.79	20.0	236	Moderate turbidity, brown
MW02	18/08/2005	8950	5370	7.23	3.74	21.9	211	Slight turbidity
MW03	18/08/2005	2382	1429	6.97	3.07	21.9	227	Slight turbidity, brown
MW04	18/08/2005	2146	1288	6.96	1.67	22.8	223	Turbid, brown
MW05	18/08/2005	948	569	6.98	1.88	24.6	232	Slight turbidity, brown
MW06	18/08/2005	841	505	7.06	1.57	24..2	221	High turbidity brown
MW07	18/08/2005	1269	761	7.13	2.88	19.3	244	Slight turbidity
MW08	18/08/2005	1381	829	7.46	3.82	20.5	201	Slight Turbidity, brown
MW09	18/08/2005	4610	2766	7.19	5.11	19.7	225	Turbid, grey
MW10	18/08/2005	2570	1542	7.20	3.52	20.1	211	High Turbidity brown
MW11	18/08/2005	6130	3678	6.88	4.99	19.5	236	Turbid, grey
MW12	18/08/2005	1167	700	6.82	2.96	19.5	231	Turbid, brown
MW13*	25/08/2005	1707	1024	7.13	4.42	18.3	149	Turbid, orange brown

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
* Data collected on 25 August 2005

Appendix D

Photographs

Photograph 1 - Upper Level

Photograph 2 - Middle Level

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D1 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 3 - Internal road on west of property

Photograph 4 - Adjacent scrap metal facility

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D2 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 5 - Lower level

Photograph 6 - Recycled water tanks

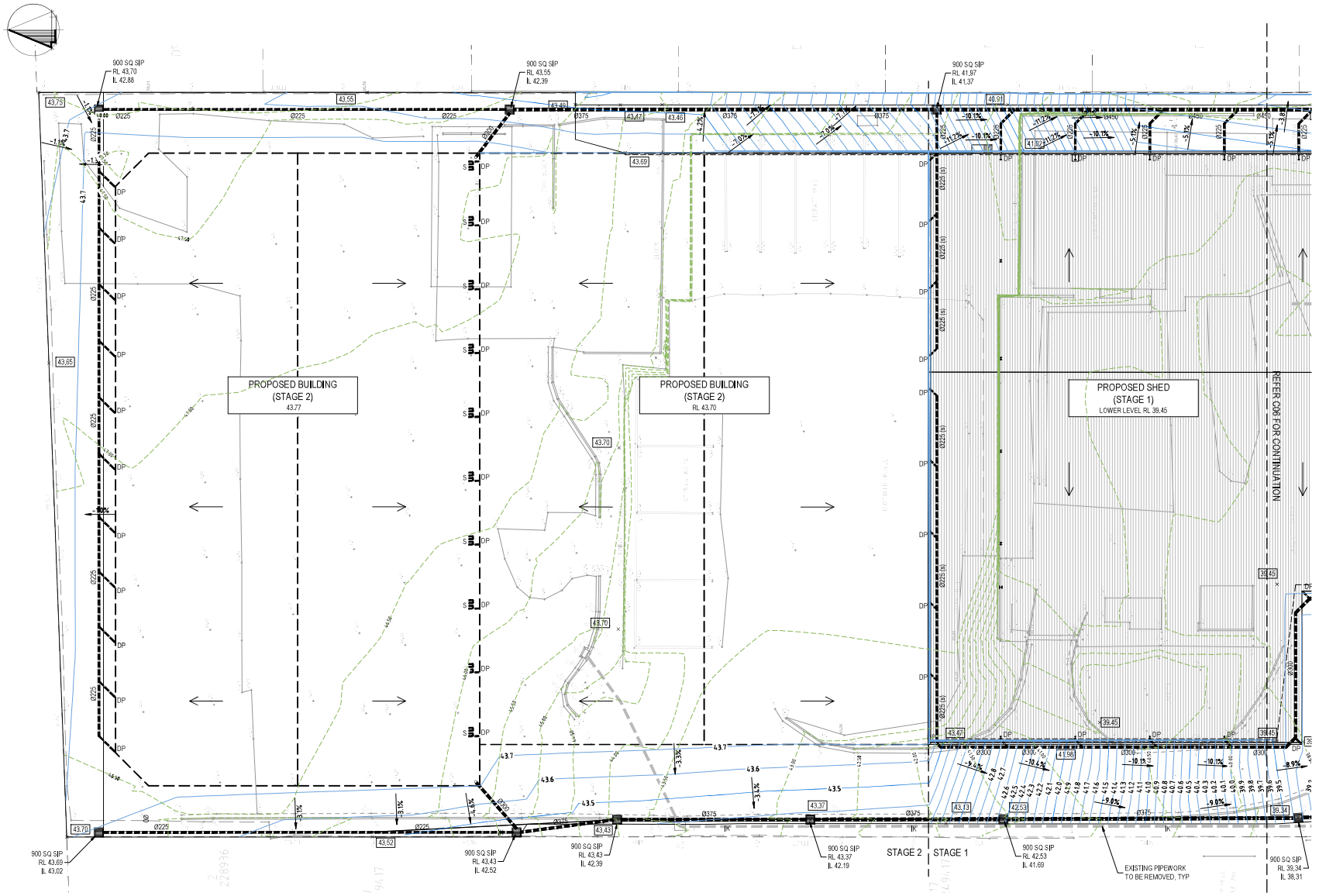
Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D3 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 7 - Unnamed tributory of Prospect Creek at Elizabeth Street

Photograph 8 - Prospect Creek at Reconciliation Drive

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D4 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Appendix D: Water Quality Design Summary



STORMWATER DRAINAGE PLAN - SHEET 1 OF 2

1:250

ALL DRAINAGE LINES SHALL BE UPVC (CLASS SH) STORMWATER DRAINAGE PIPE, UNO.
ALL DRAINAGE LINES SHALL BE LAID @ 1% FALL MIN. UNO.
FIRST FLUSH RAINWATER DEVICES TO BE FITTED TO DRAINAGE LINES TO BUILDER'S DETAIL, TYPICAL
MINIMUM EFFECTIVE EAVES GUTTER SIZE = 24,500 mm² (250 HALF ROUND GUTTER)
MINIMUM EFFECTIVE EAVES GUTTER SLOPE = 1:500
THE FOLLOWING SYMBOLS & ABBREVIATIONS HAVE BEEN USED:
DP = Ø150 DOWN PIPE
SIP = SURFACE INLET PIT (NO LINTEL)
X 100.00 = PROPOSED FINISHED SURFACE LEVEL
SPR = DENOTES DOWNPIPE SPREADER

STORMWATER DRAINAGE STRATEGY

- ALL GUTTERS & DOWNPIPES ARE DESIGNED TO ACCEPT A 1:20 YEAR ARI STORM EVENT.
- BOX GUTTERS & DOWNPIPES ARE DESIGNED TO ACCEPT A 1:100 YEAR ARI STORM EVENT.
- ALL PITS & PIPES ARE DESIGNED TO ACCEPT A 1:20 YEAR ARI STORM EVENT.
- DESIGN RAINFALL INTENSITIES:
  1:20 YEAR, 5 MIN = 167 mm/hr
  1:100 YEAR, 5 MIN = 217 mm/hr
- ALL PIPES MUST HAVE A MIN. 1.0% FALL, UNO.
- ALL STORMWATER RUNOFF IS DIRECTED TO A SQID PRIOR TO EXITING THE SITE.
- SQID's USED ON THIS SITE INCLUDE:
  - SANDFILTER
  - HUMECEPTOR
  - RAINWATER TANKS

WATER QUALITY DESIGN SUMMARY

A MUSIC MODEL HAS BEEN PREPARED TO DETERMINE THE EFFECTIVENESS OF WATER QUALITY TREATMENT DEVICES.

TREATMENT EFFECTIVENESS SUMMARY

	SOURCES	RESIDUAL LOAD	REDUCTION %	TARGET %
FLOW (ML/yr)	12.5	12.4	0.7	-
TOTAL SUSPENDED SOLIDS (kg/yr)	1420	232	83.7	80
TOTAL PHOSPHORUS (kg/yr)	2.56	0.626	75.5	55
TOTAL NITROGEN (kg/yr)	27.3	12.4	54.5	40
GROSS POLLUTANTS (kg/yr)	347	14.2	95.9	90

FOR CONSTRUCTION

A1 ORIGINAL SIZE

REVISION	DATE	AMENDMENT DESCRIPTION
B	22.10.21	ISSUED FOR CONSTRUCTION
A	28.07.21	ISSUED FOR CC APPROVAL

ECLIPSE | CONSULTING ENGINEERS
ECLIPSE Consulting Engineers Pty Ltd
304/12 Century Circuit
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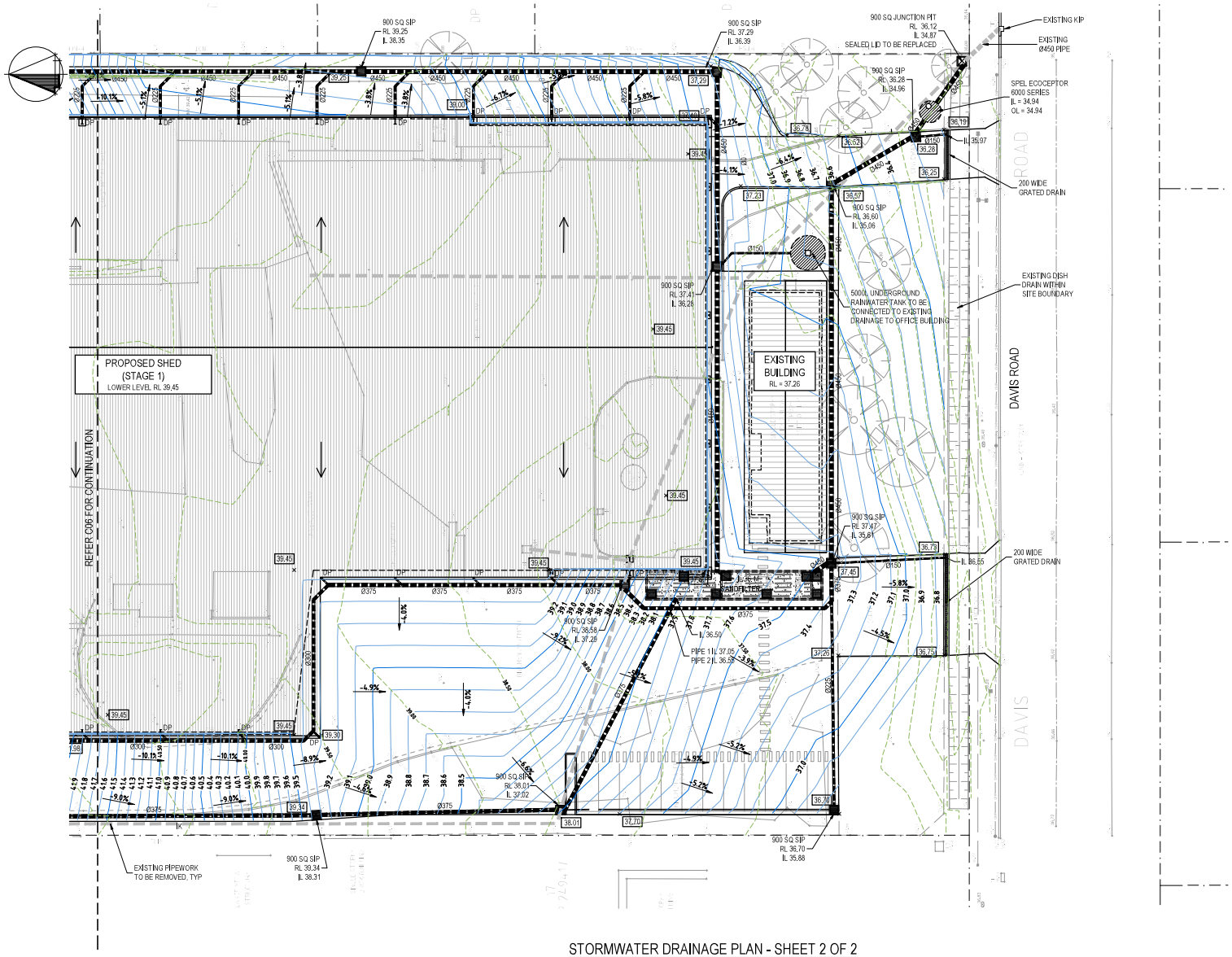
RECOVERY AND RECYCLING FACILITY

24 Davis Rd, Wetherill Park

For BORG Construction

STORMWATER DRAINAGE PLAN SHEET 1 OF 2

DESIGN	DRAWN	DATE	PROJECT No.
SWH	RCL	AUG 2020	10067
CHECKED	APPROVED	SCALE 1:250	DRG No. C05 - B



STORMWATER DRAINAGE PLAN - SHEET 2 OF 2

1:250

ALL DRAINAGE LINES SHALL BE UPVC (CLASS SH) STORMWATER DRAINAGE PIPE, UNO.
ALL DRAINAGE LINES SHALL BE LAID @ 1% FALL MIN. UNO.
FIRST FLUSH RAINWATER DEVICES TO BE FITTED TO DRAINAGE LINES TO BUILDER'S DETAIL, TYPICAL
MINIMUM EFFECTIVE EAVES GUTTER SIZE = 24,500 mm² (250 HALF ROUND GUTTER)
MINIMUM EFFECTIVE EAVES GUTTER SLOPE = 1:500
THE FOLLOWING SYMBOLS & ABBREVIATIONS HAVE BEEN USED:
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- BOX GUTTERS & DOWNPIPES ARE DESIGNED TO ACCEPT A 1:100 YEAR ARI STORM EVENT.
- ALL PITS & PIPES ARE DESIGNED TO ACCEPT A 1:20 YEAR ARI STORM EVENT.
- DESIGN RAINFALL INTENSITIES:
  1:20 YEAR, 5 MIN = 167 mm/hr
  1:100 YEAR, 5 MIN = 217 mm/hr
- ALL PIPES MUST HAVE A MIN. 1.0% FALL, UNO.
- ALL STORMWATER RUNOFF IS DIRECTED TO A SQID PRIOR TO EXITING THE SITE.
- SQID's USED ON THIS SITE INCLUDE:
  - SANDFILTER
  - HUMECEPTOR
  - RAINWATER TANKS

WATER QUALITY DESIGN SUMMARY

A MUSIC MODEL HAS BEEN PREPARED TO DETERMINE THE EFFECTIVENESS OF WATER QUALITY TREATMENT DEVICES.

TREATMENT EFFECTIVENESS SUMMARY

	SOURCES	RESIDUAL LOAD	REDUCTION %	TARGET %
FLOW (ML/yr)	12.5	12.4	0.7	-
TOTAL SUSPENDED SOLIDS (kg/yr)	1420	232	83.7	80
TOTAL PHOSPHORUS (kg/yr)	2.56	0.626	75.5	55
TOTAL NITROGEN (kg/yr)	27.3	12.4	54.5	40
GROSS POLLUTANTS (kg/yr)	347	14.2	95.9	90

FOR CONSTRUCTION

A1 ORIGINAL SIZE

REVISION	DATE	AMENDMENT DESCRIPTION
B	22.10.21	ISSUED FOR CONSTRUCTION
A	28.07.21	ISSUED FOR CC APPROVAL

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RECOVERY AND RECYCLING FACILITY

24 Davis Rd, Wetherill Park

For BORG Construction

STORMWATER DRAINAGE PLAN SHEET 2 OF 2

DESIGN	DRAWN	DATE	PROJECT No.
SWH	RCL	AUG 2020	10067
CHECKED	APPROVED	SCALE 1:250	DRG No. C06 - B

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