



Environmental Services

Specialising in:

Acid Sulphate Soils
Contaminated Site Assessment
Air Quality Investigations

Remediation Advice and Design
Groundwater Management
Industry Training

ABN 36 835 856 256

WORKS APPROVAL APPLICATION & SUPPORTING DOCUMENTS

**Lot 20, Adelaide St
Hazelmere**

March 2014

PREPARED FOR:

Wasterock Pty Ltd

Mobile Dewatering Environmental Services as trustee for
Mobile Dewatering Environmental Services Unit Trust
U1/22 Elmsfield Road, Midvale, Western Australia 6056
P: +61 (0) 8 9250 6960 F: +61 (0) 8 92508269
U1/69 Pinjarra Road, Mandurah, Western Australia 6056
P: + 61 (0) 8 9535 4398
W: www.environmentalservices.com.au



Environmental Services

DOCUMENT DETAILS

Title:	Works Approval Application & Supporting Documents
Project Address	Lot 20, Adelaide Street, Hazelmere.
Client	Wasterock Pty Ltd
Job Number	E2012 – 031
Author:	Mathew Bulmer, Kevin White
Project Manager	Greg Watts
Email:	greg@environmentalservices.com.au
Status:	Final v2
Synopsis:	<p>This document has been prepared in accordance with the Environmental Protection Act (1986), Environmental Protection Regulations (1987), Contaminated Sites Act, Western Australia (2006) and Department of Environment Regulation (DER) Contaminated Sites Management Series guidelines. In addition, the Environmental Health Directorate of the Department of Health of WA provides DER with advice on the public health aspects of contamination that presents, or has the potential to present, a risk of harm to human health, the environment or an environmental value.</p> <p>This Works Approval Application (WAA) details function and operational management requirements for the excavation/remediation and regeneration of historical landfill soils during development works of Lot 20 Adelaide St Hazelmere.</p>


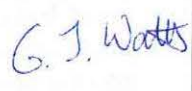
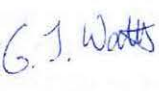


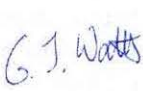


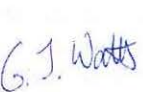
Mobile Dewatering Environmental Services as trustee for
Mobile Dewatering Environmental Services Unit Trust
U1/22 Elmsfield Road, Midvale, Western Australia 6056
P: +61 (0) 8 9250 6960 F:+61 (0) 8 92508269
U1/69 Pinjarra Road, Mandurah, Western Australia 6056
P: + 61 (0) 8 9535 4398
W: www.environmentalservices.com.au

DOCUMENT DISTRIBUTION



Environmental Services

DOCUMENT DISTRIBUTION

Version No	Written by Date	Reviewed by Date	Issued by Date	Distributed to	Copies
Draft	Mathew Bulmer 20/02/14	Greg Watts 21/02/14	Greg Watts 21/02/14	Wasterock Pty Ltd	Email
Signed					
Final v1	Mathew Bulmer 04/03/14	Mike Waite 07/03/14	Greg Watts 04/03/14	Wasterock Pty Ltd & DER & Department of Health (DoH) & Australian Environmental Auditors (AEA) & Glen McLeod Consulting Lawyers	Hard Copy & CD
Signed					
Final v2	Mathew Bulmer 09/05/14	Mike Waite 09/05/14	Greg Watts 09/05/14	Wasterock Pty Ltd & DER & Department of Health (DoH) & Australian Environmental Auditors (AEA) & Glen McLeod Consulting Lawyers	Pages Amended re-issued – to replace within the existing master WAA document folder.
Signed					

Disclaimer

This document has been prepared in accordance with a scope of works, set out in a proposal, or as otherwise agreed, between the client and MDW Environmental Services (MDWES). The scope of work may have been limited by time, budget, access and or other constraints and has been prepared in the absence of any knowledge of the study area other than that stated in this document. This document has been prepared on behalf of and for the exclusive use of the client, and is subject to and issued in accordance with the agreement between MDWES and the client. MDWES accepts no liability or responsibility whatsoever in respect to its use, or reliance upon, by any third party outside of its intended use. This document has commercial confidence status. Copying of this report or any part thereof is not permitted without the authorisation of the client, for the expressed purpose of regulatory assessment. Unless specifically agreed otherwise, MDWES retains intellectual property rights over the contents of this document.

Unless otherwise stated, MDWES regards the extent of investigations and assessments reasonable in the context of the scope of works and the purpose of the investigation. The information contained in this document is provided in good faith in the general belief that no information, opinions, conclusions or recommendations made are misleading, but are reasonable and appropriate at the time of issue of this document. This document must be read in its entirety. Users are cautioned that assumptions made in this document may change over time and it is the responsibility of the user to ensure that assumptions remain valid. Reported results, while accurate at the time of reporting cannot be considered absolute or conclusive without long term follow up studies.

Comments and opinions presented in this document are based on the extent of the scope of works and / or on information supplied by the client, their agents and / or third parties. In preparing this document MDWES has relied upon reports, data, surveys, analyses, designs, plans and / or other information provided by the client and other individuals and organisations outside its control. Except as stated otherwise in the document MDWES has not verified the accuracy or completeness of this information. To the extent that the statements, opinions, facts, information, conclusions and / or recommendations in the document are based in whole or part on this information, those are contingent upon the accuracy and completeness of the information. MDWES will not be liable in relation to incorrect conclusions should any information be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed.

Within the limitations imposed by the scope of work, the assessment of the study area and preparation of this document have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants and occupational hygienists under similar circumstances. No other warranty, expressed or implied, is made. MDWES will not be liable to update or revise the document to take into account any events, circumstances or facts occurring or becoming apparent after the date of this document.

Specific warning is given that many factors, natural or artificial, may render conditions different from those that prevailed at the time of investigation and should they be revealed at any time, they should be brought to our attention so that its significance may be assessed and appropriate advice may be offered.

MDWES, its agents and employees, expressly disclaim any and all liability for representations, expressed or implied, contained in, or omissions from, this report or any of the written or oral communications transmitted to the client or any third party.

Acceptance of this document denotes acceptance of these terms.

Table of Contents

1	INTRODUCTION	8
1.1	Previous Reports	8
1.2	Site Statistics	9
1.3	Project Background Information.....	10
1.4	Purpose of Application	11
1.5	Purpose of this Document.....	11
2	ADMINISTRATION	12
2.1	Applicant/Occupier Details.....	12
2.2	Premises Location Details	12
2.3	Surrounding Environment	12
2.4	Prescribed Premises Category	13
2.5	Timing of Construction and Operation	13
2.6	Stakeholder Consultation.....	14
2.7	Logistics.....	14
2.8	Fire Risk	14
3	ENVIRONMENTAL SETTING.....	15
3.1	Physical Environment	15
3.1.1	Climate.....	15
3.1.2	Topography.....	15
3.1.3	Surface and Groundwater	15
3.2	Biological Environment	16
3.2.1	Flora and Vegetation.....	16
3.2.2	Fauna.....	16
3.3	Social Environment.....	16
3.3.1	Residential Receptors	16
3.3.2	Groundwater Receptors	17
3.3.3	Air Receptors	17
3.3.4	Noise Receptors	17
3.4	Areas of Significance	18
4	PROJECT DESCRIPTION, DESIGN & CONSTRUCTION	19
4.1	Overview.....	19
4.2	Duration of Project.....	19
4.2.1	Projects Stages.....	19
4.3	Proposed Site Access.....	20
4.4	Site Boundary construction	21
4.5	Utilities	21
4.6	Water Management and Use	21
4.7	Drainage	22
4.8	Dust Suppression	23
4.8.1	Misting System Details.....	23
4.9	Excavation Progression	24
4.10	Production of Engineered Fill.....	24
4.10.1	Capping Layer	25
4.10.2	Physical Barrier Layer	25
4.10.3	Engineered, Repackaged Deep Cell.....	25
4.11	Required Soil Stream Volumes.....	25
4.12	Storage of Processed Material.....	26
4.13	Vehicle Parking.....	26
4.14	Fuel Handling	26

4.15	Vehicle Maintenance	28
4.16	Vehicle Wash.....	28
4.17	Vehicle Load Acceptance	28
5	POLICY FRAMEWORK.....	29
5.1	Moving Zero Waste Streams	30
5.2	Environmental Protection Policy	30
5.3	State Environmental Policies	30
5.4	Part V, Sections 52 and 53	30
5.5	Air Quality	31
5.6	Water.....	31
5.7	Soil	32
5.8	Energy Efficiency Greenhouse Gas Emissions.....	32
5.9	Noise	33
5.10	Odour.....	34
6	RESOURCE RECOVERY & REMEDIATION FACILITY	35
6.1	Inputs & Outputs.....	35
6.2	Crushing Plant	36
6.3	Screening Plant	37
6.4	Heavy Duty Separator	38
7	SOIL ACCEPTANCE & AMENDMENT FACILITY	39
8	ENERGY USE AND GREEN HOUSE GAS EMISSIONS	40
8.1	Greenhouse Gas Emission Assessment Framework.....	40
8.2	Estimation of Energy Consumption.....	41
8.3	Estimation of Greenhouse Gas Emissions.....	42
8.4	Measures to Reduce Greenhouse Gas Emissions	42
8.5	Energy Assessment.....	43
	References.....	44

TABLES WITHIN REPORT

Table A	Summary of Site Statistics
Table B	Surrounding Land Uses
Table C	Prescribed Premises Categories Proposed for the Project
Table D	Operational Hours
Table E	Groundwater Direction, Layers & Aquifers
Table F	Separation Distances According to Proposed Premise Categories
Table G	Summary of Staged Construction
Table H	Road Construction Details
Table I	Details of Utility Providers
Table J	Summary of Groundwater Abstraction
Table K	Adopted Dust Suppression Techniques
Table L	Estimated Required Volumes
Table M	Description of Crushing Plant
Table N	Description of Screening Deck
Table O	Heavy Duty Separator
Table P	Description of Soil Amendment Area
Table Q	Estimated on Site Diesel Use

APPENDIX

Appendix A – Figures & Supporting Documents (including)

- Figure 1** Site Location Map
- Figure 2** Proposed Site Access Road
- Figure 3** Proposed Engineered Landfill Details
- Figure 4** Proposed Locations of RRRF and SAAF
- Figure 5** Groundwater Abstraction - Well Location
- Figure 6** Crushing Plant Data
- Figure 7** Crushing Plant Noise Assessment
- Figure 8** Screening Plant Data
- Figure 9** Screening Plant Noise Assessment

Works Approval Application Form

Supporting Correspondents

Supporting Documents to the Works Approval Application Report (Including)

MDWES Environmental Site Management Plan (ESMP)

The ESMP includes the following Reports as supporting documents:

- Greg Rowe Assoc. - Community Consultation
- Wasterock - Works Agreement & Site Management Plan (SMP)
- NTEC - Groundwater Modelling Hazeland (GWM)
- MDWES – Groundwater Abstraction for Dust Suppression (GWAMP)
- MDWES – Air Quality Management Plan (AQMP).
- MDWES - Soil Amendment Management Plan (SAMP)

MDWES Groundwater Monitoring Events (GME)

The GME's were undertaken by MDWES as part of the initial investigation into the potential for groundwater contamination from the Site.

- MDWES – Ground water Monitoring Events which includes:-
 - Groundwater Investigation Report - GME #1 - May 2012
 - Addendum 1 - GME #2 – September 2012
 - Addendum 2 – GME #3 – February 2013
 - Addendum 3 – GME #4 – May 2013
 - Annual Ground Water Summary Reports (September 2013).

EXECUTIVE SUMMARY

Wasterock's project goal is to rejuvenate a 16.9ha site within the Hazelmere area east of Perth. This will be achieved by remediating a historical landfill which has been left dormant and has been a blight on the landscape of Perth for several years. Wasterock's turnkey proposals will create a viable, developable plot of land for commercial and economic growth which will benefit the local community and State of Western Australia.

The redevelopment of this land will not only reduce the current environmental impact of a historical landfill. It will also address the associated stigma and visual impact. At present the landfill rises above ground level to approximately 6 to 8 metres in places. It is unkempt, unsightly and has been used for ad-hoc illegal fly tipping and dumping.

The proponent aims to remediate and repackage the material within the historical landfill through excavation, sorting and reinstatement. This in turn will reduce the volume of the material and subsequent level of the site in conjunction with compaction. The material within the landfill is presumed to be predominantly inert material such as sands, builders' waste and rubble (concrete). However, records show that non-inert material was accepted in the form of waste slurries, asbestos sheeting, and waste metals, to name a few of the products accepted. Furthermore, as part of the remediation, the concrete and larger material will be repackaged and re-used as a visible break layer and barrier to ensure that any future development does not disturb the underlying soil material.

Further green credentials for recycling are gained via the acceptance of inert soil materials which would normally end up in a licensed landfill. The proponent aims to re-use Class I (hydrocarbon Impacted only) and Acid Sulfate Soils (ASS) for the Capping Layer. These soils will be obtained from the Perth metropolitan area. Soils will be adjusted or remediated within a Soil Acceptance and Amendment Facility (SAAF) which will validate and ensure the soils are fit for purpose. This will be achieved through field and laboratory testing undertaken before being transferred and used as capping material in the project.

The duration of the project has been estimated as 4-5 years, based on the volume of soils to be remediated and soils required for the capping layer.

1 INTRODUCTION

This Works Approval Application (WAA) has been prepared by MDWES for Wasterock Pty Ltd (the Client). The WAA is for the proposed management, remedial works and regeneration of an historical landfill at Lot 20 Adelaide St, Hazelmere WA (the Project), herein will be referred to as 'the Site'.

Wasterock proposes to remediate the Site using conventional excavation techniques for a 'fit for use' status (commercial). The proposal also includes a finished final level suitable for future development which comprises reducing the current height and fill content of the site.

The remedial works of the Site will involve the following stages:

1. Excavation, sorting and processing (crushing and/or screening) of existing material.
2. Acceptance of soil for amendment such as Acid Sulfate Soils (ASS) and Hydrocarbon Impacted Soils (HIS) (Class 1 only) for recycling and reuse. These soils will ultimately be used for the capping layer (Ground Level to 1.5mbgl).
3. Processing (crushing and/or screening) of construction and demolition (C&D) waste for recycling and reuse on Site to engineer a physical warning barrier, break layer 0.5m in thickness, 1.5 to 2.0mbgl.
4. Engineered placement, compaction and construction of excavated remediated soil material to form a controlled engineered cell. (2.0mbgl to base of landfill).

The remediation of the site includes the outsourcing and acceptance of soil material for the capping layer. This will be sourced from local building and development projects within the Perth metropolitan area. Soils will be screened, certified clean and environmentally cleared 'fit for use' and will be further validated before being used to construct the capping layer.

It should be noted that soils accepted for recycling will be analysed and assessed in accordance with the Environmental Site Management Plan (ESMP). Analysis will also be in line with the Department of Environmental Regulation (DER) Contaminated Site Management Series and Department of Health (DoH) Guidelines to ensure compliance with current guidelines for soil, air and water.

Further note should be made to the future of the Hazelmere remediation project and the post construction environmental management and validation plan. This has not been accounted for within this WAA document, however, has been discussed in the supporting document of the "Environmental Site Management Plan (ESMP)". Within the ESMP report consideration and comment is given with regards to the short, interim and long term environmental monitoring plans. The presented plans are in relation to soil and more specifically groundwater and landfill gas which should be validated and monitored to ensure the project has not environmentally impacted or has cause to impact the surrounding environs and/or effect the health of end users.

1.1 Previous Reports

Several reports and investigations have been undertaken on the subject Site from c.2005 to the present. The information and results of these investigations are compiled in the following documents and should be read in conjunction with this WAA:

- FOI 1233/05 by Department of Environment & Conservation (DEC) – Freedom of Information – Lot 20, Adelaide Street, Hazelmere (October 2005);
- 2145245A:PR2_16644.RevA by Parsons Brinckerhoff – Site Investigation (SI) – Hazelmere, WA (July 2006) (see figure 1);
- V392/2007 grw4469 by Knight Frank – Valuation Report – Lot 20 Adelaide Street, Hazelmere, WA (July 2007);

- 476300-0kjc070709a by Burgess Rawson – Valuation Report – Lot 20 Adelaide Street, Hazelmere, WA (July 2007);
- 60150301 by AECOM – District Storm water Management Strategy – Hazelmere Enterprise Area (June 2010);
- Drilling Logs by Banister Drilling & Irrigation for 20 Adelaide Street, WA. (May 2012);
- E2012-031 (GME) – MDWES – Groundwater Monitoring Event #1 – Adelaide Street Hazelmere (May 2012);
- NTEC Environmental Technology – Groundwater Modeling for the Wasterock Hazelland Landfill Site in Hazelland. (September 2012).
- E2012-031 (GME) – MDWES – Groundwater Monitoring Event #2 – Adelaide Street Hazelmere (August 2012);
- E2012-031 (GWAMP) – MDWES – Groundwater Abstraction for Dust Suppression & Surface Compaction v2 – Adelaide Street Hazelmere (October 2012);
- E2012-031 (GME) – MDWES – Groundwater Monitoring Event #3 – Adelaide Street Hazelmere (January 2013);
- E2013-031 – (SAMP) - MDWES – Soil Amendment Management Plan – Lot 20 Adelaide Street, Hazelmere (March 2013).
- E2012-031 (GME) – MDWES – Groundwater Monitoring Event #4 – Adelaide Street Hazelmere (June 2013);
- E2012-031 (AQMP) – MDWES – Air Quality Management Plan (AQMP) v2 – Adelaide Street Hazelmere, (October 2013).
- E2012-031 (GMES) – MDWES – Annual Groundwater Monitoring Event Summary Report (GMES) v2 – Adelaide Street Hazelmere, (October 2013).
- GRA 7729 by Greg Rowe & Assoc. – Community Management Strategy for Remediation of Former Landfill Site: Lot 20 Adelaide Street, Hazelmere. (March 2014);
- 6045.k.09_09082_SMP by Waste Rock Pty Ltd – Site Remediation Works Agreement and Site Management Plan (Final) – Lot 20 Adelaide Street. (March 2014);

It should be noted that the MDWES ESMP report listed above has been included as supporting documentation to this Works Approval Application (The ESMP includes the MDWES reports: SAMP, GWAMP, SMP and AQMP reports (see above).

1.2 Site Statistics

The project Site is approximately 565m in length and 300m wide which equates to an area of 16.9 hectares. Investigations to date have found that the fill material has been proven up to 6.5 metres below ground level (mbgl). However, it has been reported that the fill may be as deep as 8mbgl in places. The finished level of the historical landfill currently varies between 6 to 8 meters above surface level (masl). This is summarised in Table A below.

Table A: Summary of Site Statistics

Length (m)	565
Width (m)	300
Approximate Area (ha)	16.9 ha (169,000m ³)
Proven Depth of Landfill (mbgl)	6.5 (maximum)
Height of Landfill (magl)	8.0 (maximum)
Estimated Landfill Volume Total (m ³) ¹	1,695,000 m ³

¹ The volume is based on an average depth of 10m for the landfill material above and below ground level.

Within the non-land filled area of the Site situated along the western boundary. The surface appears to be generally flat in topography that ranges between 26.69m Australian Height Datum (AHD) in the southwest corner, sloping gently upwards to approximately 27.24m AHD in the northwest corner. (c.1990 site survey).

Steep battered edges between 6m and 8m in height define the edge of the landfill within the centre of the site. A shallow access ramp is located in the middle of the southern edge and leads to the top of the landfill which is generally flat and level. The north western edge of the landfill has a slighter gradient than the other edges of the landfill. The site's current status is 'Not Fit for Use' and varies with earthen benches and swales.

1.3 Project Background Information

The Site has been operated by multiple proponents as a licensed "inert" landfill from c.1987 to c.1997. This is after previously being mined for building and construction sands. It was reported that the sand was extracted down to the clay substrate which has been noted up to 6.5mbgl. However, it has been reported that it may be deeper. The true depth of the landfill will not be determined until the remediation begins.

Given the history and land use of the Site, a contamination assessment was undertaken by Parsons Brinckerhoff in 2006. This report summarised the extent and general nature of uncontrolled fill present and discussed the environmental significance of any impacts detected with reference to the *Western Australian Contaminated Sites Management Series Assessment Levels for Soil, Sediment and Water* (DoE 2003) (Parsons Brinckerhoff 2006).

It has been further reported that non-approved waste streams were disposed of at the Site. The non-inert waste included oil sludge, emulsion factory waste, drums of bitumen and kerosene, crayfish shells, asbestos sheeting and pipes and two large baker's ovens containing asbestos together with insulation material. Additionally, the landfill has been operated such that the current topography of the Site is unsuitable for development (Parsons Brinckerhoff 2006).

Parsons Brinckerhoff (2006) concluded that the majority of fill material at the Site is inert construction and demolition waste in a sand matrix. However, fragmented asbestos containing materials (ACM) were identified at several surface locations across the site. Furthermore, studies have identified varying levels of contamination, primarily caused by Total Petroleum Hydrocarbons (TPH's), Monocyclic Aromatic Hydrocarbons (MAH's), Polychlorinated Biphenyls (PCBs) and Heavy Metals all present within the fill material.

In 2007, following the assessment of the Parsons Brinckerhoff report, the DER (formerly DEC) classified the Site under Section 13 of the *Contaminated Sites Act 2003* (CS Act) as 'Possibly Contaminated – Investigation Required' (DEC 2010a). Following a compliance inspection in October 2010, DER reviewed this classification and re-classified the site as 'Contaminated – Remediation Required' (DEC 2010a).

Wasterock is proposing to redevelop the area by remediating the Site via excavation and repackaging of materials, this will be soils as engineered inert material. An engineered barrier layer will be placed over the repackaged materials. This will be followed by a validated layer of clean cover. The project is expected to take approximately four to five years to complete the necessary works. The ultimate aim of the project is to rehabilitate the land, such that it can be utilised within the community, through subdivision into smaller light industrial/commercial lots or as one large commercial lot.

1.4 Purpose of Application

The Wasterock project is subject to Works Approval Application (WAA) by the Department of Environment Regulation (DER) under Section 53 of the *Environmental Protection Act 1986* (EP Act), which lists a number of circumstances where activities at the prescribed premises trigger the need for Works Approval. In this case, it is due to proposed changes in the storage, handling, transport and treatment of soil currently at the Site. The Site also includes the generation of emissions such as Greenhouse Gases (GHG), odour, noise and dust. The purpose of the WAA is to ensure these discharges to the environment are minimised or adequately controlled in accordance with current regulations.

The Resource Recovery & Remediation Facility (RRRF) and Soil Acceptance & Amendment Facility (SAAF) facilities are expected to function until the Site is suitable for future development, ie following completion of remedial activities.

1.5 Purpose of this Document

This WAA will document and describe those processes that may cause environmental impact, and describe mitigating factors and provide solutions in a pragmatic manner. The report will draw on current legislation to ensure that discharges to the environment are minimised and/or adequately controlled by the Site's operations, such that they are environmentally acceptable.

The Department of Environment and Regulation (DER) regulates prescribed premises under Part V of the EP Act. Furthermore, under Schedule 1 of the *Environmental Protection Regulations 1987*, the Site would be classed as a "prescribed premise".

"The Occupier of a premise should obtain a works approval when undertaking work which would cause the premises to become a "prescribed premise". For established premises, the EP Act specifies when a works approval is required for a range of actions that may alter emissions or alter the operation of the premises".

"The purpose of the works approval is to ensure the premises, plant and equipment are designed, sited and can be managed, so that emissions from the premises are environmentally acceptable".

The following sections of the Works Approval Decision Matrix (DER industry guide) apply to the site and fall under section 52 and 53 of the EP Act. The relevant and applicable sections are stated below:

- Will the proposed work cause an emission, or alter the nature or volume of the waste, noise odour [s.53(1) and 53 (2)]?
- Will the proposed work alter the method of operation, or any process carried out at the prescribed premises [s.53(1)(a)]?
- Will the proposed work alter, construct or install any equipment on the prescribed premises for the following:
 - Storage, handling, transport or treatment of waste for the purpose of the discharge of waste?

Or

- Control of noise, odour prior to, and for the purpose of, the emission or transmission of noise and odour. [s.53(1)(b)]?

A copy of the completed application form for the Works Approval is provided in Appendix A. Further reference with regards to the legal precedent should be made to the letter presented in Appendix A. The letter is in reference to the classification of the site as a remediation project and not a landfill facility.

2 ADMINISTRATION

A Site Management Plan (SMP) has been developed by Wasterock Pty Ltd. The SMP details the roles and responsibilities of the shareholders involved and the on-Site operational measures to be undertaken for the duration of the project.

The Wasterock SMP provides details of operational and regulatory procedures to be utilised during the sites operations. This includes, but is not limited to, responsibilities of managers, first aid procedures, occupational health management, site traffic management and site reporting procedures. For further information on site management, reference should be made to the ESMP in the supporting documents, which includes the Wasterock SMP.

2.1 Applicant/Occupier Details

The applicant and occupier of the premises for which this application is being made are as follows:

Wasterock Pty Ltd (Wasterock)

1/32 Ledger Rd, Balcatta, WA, 6021

Phone: (08) 6241 4100

Fax: (08) 9240 6220

Proponent representative: Peter Moltoni

2.2 Premises Location Details

The Site is located within the City of Swan, approximately 14 km east, north east of the Perth CBD, 6km east of the Swan River and 1 km west of the Darling Fault (See figure 1).

The Site is zoned 'rural' under the Metropolitan Region Scheme (WAPC 2012) with a frontage of approximately 565 metres onto Adelaide Street. The historical landfill covers the majority of the Site. The Site is mostly vacant with a small shed located in the south western corner. Grass and weeds cover the majority of the Site while some low lying shrubs and juvenile and semi-mature trees grow sporadically over the Site (also see Section 1.2 for site dimensions).

2.3 Surrounding Environment

Surrounding environs and land use in the vicinity of the Site are outlined in the Table B, below:

Table B: Surrounding Land Uses

Orientation	Description
North	Scattered special residential dwellings on semi-rural properties which also includes a disused market garden and horse trotting tracks.
East	Roe Highway, to the immediate east (running north to south), followed by a small area of medium density residential dwellings. In addition, on the south-east boundary (subject Site) an operational sand quarry and landfilling operation can be observed.
South	Medium density residential dwellings are noted along Adelaide Street. A Bush Forever Site N°122 can also be found approximately 10m to the south-east of the Site.
West	An ice works is located immediate to the west, followed by residential dwellings set on semirural properties.

Further details and descriptions are expanded upon in the ESMP within the supporting documents.

2.4 Prescribed Premises Category

The Project requires approval to construct and operate under the categories outlined in Table C as specified in Schedule 1 of the Environmental Protection Regulations 1987.

Table C: Prescribed Premises Categories Proposed for the Project

Category Number	Description of category	Production or design capacity (in tonnes)
12	Screening and processing of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated.	50,000 or more per year
13	Crushing of building material: premises on which waste building or demolition material (eg bricks, stones or concrete) is crushed or cleaned	1000 or more per year
61A	Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land.	1,000 or more per year
62	Solid waste depot: premises on which waste is stored, or sorted, pending final disposal or re-use.	500 or more per year
67a	Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.	1,000 or more per year

2.5 Timing of Construction and Operation

Construction and earthworks for the Site are proposed to commence in mid-2014. Wasterock proposes to construct and commence operation of the RRRF and SAAF once approval is granted by the relevant authorities. The anticipated duration of the project is 4 to 5 years to complete the remediation of the Site. However, this will be dependent on the availability and complexity of remediation for the on-site materials. The timing also depends on the availability of recyclable input soil material for the capping layer (ASS & HIS soils), which in turn is dependent on the level of building and construction work within the Perth Metropolitan Area.

The Site will operate from Monday to Saturday each week. The site will be closed on Sundays and public holidays. Table D denotes the operational hours of the site.

Although there are no operations on Sundays, machine maintenance could be carried out on Saturday afternoons and Sundays. Such maintenance would be remote from residential areas and carried out on the northern boundary of the site.

Table D: Operational Hours

Day	Opening Time	Closing Time
Monday to Friday	07:00 am	17:30pm
Saturday	08:00 am	16:00pm
Sunday & Bank holidays	Closed	

2.6 Stakeholder Consultation

Community consultation and assessment was undertaken as part of an Environmental Site Management Plan (ESMP) by MDWES. The report is presented in the supporting documents. The following stakeholders for the Project have been identified as being:

- Wasterock Pty Ltd
- MDW Environmental Services (MDWES)
- Greg Rowe Associates
- Australian Environmental Auditors (AEA)
- Department of Environment Regulation (DER).
- Department of Health (DoH).
- State and local government, including the City of Swan and Shire of Kalamunda.
- Local Community members.

2.7 Logistics

Several two-way truck movements are expected each day of operation, involving both rigid and semi-trailer vehicles. All vehicle access to the Site is limited to a designated Site entry location which is proposed to be via Talbot Road. There will be no truck access from Adelaide Street.

The speed limit within the Site will be restricted to 10 Km/hr (off road). Users of the Site are notified of site entry requirements. Offenders, after reasonable warning, would be banned from future use of the facility.

All facilities on Site are to be portable so that they can be moved as the project progresses across the site. It is also preferred to have the facilities as close as possible to the current stage of works. A single location far away from the works is not practical for land rehabilitation operation.

2.8 Fire Risk

The risk of fire occurrence at the Site is very low. However, the following contingency plan will be adopted and detailed in the SMP which is attached to the ESMP in the supporting documents.

- Continual water supply has been established for dust suppression and would be deployed and utilised for fire suppression if needed.
- On-site earthmoving equipment will be incorporated into efforts to extinguish a fire.
- Earth moving equipment will be fitted with appropriate fire extinguishing equipment.
- Area Managers and the Site Manager will be supplied with a mobile phone, iPad or similar to enable contact with emergency services.
- Where existing vegetative material may be at risk from fire due to site operations, this material will be stripped back as the project progresses. This is to ensure that a reasonable buffer zone exists to ensure that no accidental ignition occurs.

In the unlikely event that a fire occurs, details of the date, time and location, cause or suspected cause and action taken to extinguish the fire will be accurately documented and recorded. These details will be communicated to the DER and appropriate authorities within 24 hours of the event.

3 ENVIRONMENTAL SETTING

The Site has been extensively investigated and reported with regard to environmentally characterising and profiling the condition of the soil and groundwater. Furthermore, MDWES has presented an Environmental Site Management Plan (ESMP) which outlines the environmental monitoring for the duration of the project. For further information, reference should be made to the MDWES ESMP report in the supporting documents.

3.1 Physical Environment

A summary of the physical, biological and social environment is presented in the following sections.

3.1.1 Climate

The Site experiences a Mediterranean climate, characterised by hot, dry summers and mild, wet winters. These seasons transition into the autumn and spring months. Annual average rainfall is 869 mm, 80% of which falls between May and September.

3.1.2 Topography

The original surface level of the Site has been altered due to historical sand mining at the site and the resulting historical landfill. The lowest part of the Site is approximately 27mAHD (Relative Level metres Australian Height Datum) within the southwest corner of the Site where there is no evidence of historical landfilling.

The Site slopes upwards to approximately 35mAHD in the south-eastern corner of the Site where some of the highest points on site occur. Furthermore, the central portion of the site fluctuates between 33 and 35mAHD which comprises the landfill. See section 2.1 for site dimensions.

3.1.3 Surface and Groundwater

Water-bearing layers and aquifers that potentially occur beneath the site as set out in Table E below (DoW, 2012):

Table E: Groundwater Direction, Layers & Aquifers

Aquifer	Depth From	Depth To	TDS mg/L	Use	Permeability	Groundwater Flow Direction
	mbgl					
Superficial Aquifer Cloverdale Area	12	31	500 – 1000	suitable for garden use	High	North Westerly

Standing water level measurements were recorded by MDW Environmental Services (MDWES) during the four quarterly groundwater visits from May 2012 to May 2013.

Groundwater was intercepted between 18.6 RL mAHD and 23.8 RL mAHD. Therefore, it is anticipated that Groundwater will not be intercepted during the proposed project.

Groundwater levels in the wells changed by 0.8m over the 2012-2013 groundwater monitoring periods (4). This was attributed to seasonal variations.

An interface meter was used to verify the presence / absence of free-phase hydrocarbon products in the groundwater. No free-phase products were detected during any of the visits.

No surface water bodies were identified within 500 m of the site. The nearest natural surface water bodies are two wetlands located approximately 1.5 km to the northwest of the site (Parsons Brinckerhoff, 2006).

3.2 Biological Environment

3.2.1 Flora and Vegetation

There is no remnant native vegetation on-site. Vegetation cover at the Site is sparse, consisting of introduced weed species, predominantly grasses and low level bushes, juvenile and semi-mature trees. The flora will be systematically stripped as part of the remediation process as the project progresses and not en-mass is to reduce wind blown loose surface sands and so not to generate a dust issue. Care will be taken to ensure that a fire is not started by site operations, particularly in the summer months.

3.2.2 Fauna

As there is no remnant vegetation remaining on-site, the Site is unlikely to provide a suitable habitat for fauna.

There is a recorded Bush Forever site (Ref:122) located approximately 10m south east of the project Site. Adelaide Street dissects the area, so it is possible that native and non-native fauna species have traversed this area.

3.3 Social Environment

3.3.1 Residential Receptors

EPA Guidance Statement No. 3 - *Guidance for the assessment of environmental factors (in accordance with the Environmental Protection Act 1986)*:

"Separation distances between industrial and sensitive uses (EPA 2004) define residential areas as a sensitive receptor".

The closest sensitive receptor to the Site is approximately 30 m of the southern boundary of the property. This comprises the medium density residential development that fronts on to Adelaide Street. Recommended separation distances for the five premise categories applied for are presented in Table F below.

Table F: Separation Distances According to Proposed Premise Categories

Category Number	Description of category	Separation distance (m)
12	Screening, etc. of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated. <u>NOT POSSIBLE</u> as the proponents have to treat excavate and process the landfill up to Adelaide St, however a earth bund and fencing will reduce any noise and the visual impact from local residents.	500m
61A	Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land.	Case by case
62	Solid waste depot: premises on which waste is stored, or sorted, pending final disposal or re-use.	200
63	Waste disposal – Crushing of building material: premises on which waste building or demolition material (eg bricks, stones or concrete) is crushed or cleaned. Site only accepting inert waste, contaminated solid waste (Class 1), special wastes (Type 1) as specified, for burial.	150
67A	Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored outdoors/uncovered pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils. SAAF located on the Eastern boundary.	500

3.3.2 Groundwater Receptors

The closest down gradient groundwater receptor/expressions is Ollie Worrell reserve, located 4.5 kilometres (km) south east of the Project site. This reserve is managed by the Shire of Kalamunda. Surface hydrology is unlikely to be impacted by the proposed development.

3.3.3 Air Receptors

Air monitoring was not included as part of the original scope of works during the past environmental investigations. This is because the Conceptual Site Model (CSM) for the Site did not identify or assess any Contaminants of Potential Concern (CoPC) in relation to air. The environmental concerns were towards the soil and groundwater.

The remediation of the subject Site has the potential to develop airborne particulates. MDWES considers this dust generation to be of potential concern and has therefore, developed a Air Quality Management Plan (AQMP). The AQMP should be incorporated into the environmental remedial works. The AQMP is appended in the ESMP which is a supporting document to this report.

The closest sensitive receptor to the Site is approximately 30 m of the southern boundary of the property within the medium density residential development that fronts onto Adelaide Street. The proposed site works has the potential to impact the residents on Adelaide Street through dust and particle deposition via excavation. However, mitigating measures such as perimeter fencing upon an earth bund, dust suppression and water misters, coupled with dust/air monitoring, will significantly reduce the potential risks of impact. This is further expanded upon in section 5.5 and within the AQMP report appended.

As part of the community consultation, local residents will be offered an opportunity to voice any concerns or impact, through dedicated official channels with regards to the project. If odour or dust deposition becomes an issue, Wasterock will address the issue and investigate any breaches. If a breach has been noted, then operational procedures and strategies will be reviewed and revised.

3.3.4 Noise Receptors

The closest sensitive receptor to the Site is approximately 30 m from the southern boundary of the property, within the medium density residential development that fronts onto Adelaide Street.

The proposed site works have the potential to impact the residents on Adelaide Street through noise generated on site. However, mitigating measures such as an earth bund and reasonable hours of work, coupled with noise monitoring, will reduce the potential for impact.

The following aspects of the Site's operation have been identified as requiring management to ensure noise and vibration emissions from the Site do not affect the amenity of nearby noise-sensitive premises:

- Sorting and Screening.
- Loading and Transport.

Noise from these activities can be further amplified by certain meteorological conditions, such as atmospheric temperature inversions and the speed and direction of wind. The level of noise and ground vibration associated with proposed works is also variably dependent on the local geology.

Noise emissions from day to day operations at the Site will meet the criteria set out in the *Environmental Protection (Noise) Regulations 1997*.

Applicable noise limits under Regulations 7 and 8, relevant to Industrial and Utility Premises, prescribe the following noise limits at the premises boundary at all times:

- peak noise not to exceed 90dB (L_{max})
- noise not to exceed 80dB more than 1% of the time (L_{A1})
- noise not to exceed 65dB more than 10% of the time (L_{A10}).

As part of the community consultation, local residents will be offered to opportunity to voice any concerns or impact, through dedicated official channels with regards to the project. If noise becomes an issue, Wasterock will address the issue and investigate any breaches. If a breach has been noted then operational procedures and strategies will be reviewed and revised.

3.4 Areas of Significance

The Site is situated within an Environmentally Sensitive Area (ESA), administered under the EP Act. The ESA is associated with Bush Forever Site area 122, located to the south of the site. Due to its ecological importance, the project will ensure that stormwater controls are in place to prevent negative impact to the Bush Forever Site.

4 PROJECT DESCRIPTION, DESIGN & CONSTRUCTION

4.1 Overview

To enable remediation of the site, Wasterock proposes to construct and operate a Resource Recovery and Remediation Facility (RRRF) and Soil Acceptance and Amendment Facility (SAAF) located within the site boundary. The RRRF will re-use existing on-site construction and demolition (C&D) waste as clean crushable material for the physical warning barrier layer. The SAAF will accept ASS and HIS impacted soils from the Perth Metropolitan Area. This will supply the significant volumes of sand which will be recycled for the capping layer.

Soil material at the Site will be excavated and segregated on-site. This will involve separating material that is suitable for reinstatement from materials that may contain contaminants. Waste products that do contain contaminants identified through on site analysis have the potential to leach into the groundwater beneath the site. Therefore, Wasterock will ensure that any soil material repackaged and placed back into the ground is suitable for its intended use. No putrescible waste will be placed back into the deep cell; this includes any organic matter. This is so not to allow for land gas and accumulation of any landfill gas. The soils shall not contravene current legislative soil guidelines or the terms of the licence for the works application. Excavated waste material that is deemed to be unsuitable for reuse will be removed from Site and disposed of at an appropriately licensed landfill.

4.2 Duration of Project

The Site is expected to operate for approximately 4 to 5 years, until the site is fully remediated and appropriate for the intended end use "commercial/industrial development". The site operational time frames will depend on the remediation of current landfill material and the sourcing of soils to complete the capping layer.

4.2.1 Projects Stages

Before remediation operations begin in earnest, several milestones of the project have to be implemented. The key milestones are detailed in Table G. These stages may run concurrently.

Table G: Summary of Staged Construction

Stage 1	Construct the site access road and security gate.
Stage 2	Erect the Site bund and boundary fencing / construction office compound.
Stage 3	Connect power and water to the site. To include wash facilities and changing rooms.
Stage 4	Create, prepare and construct - RRRF and SAAF areas (including required plant).
Stage 5	Installation of groundwater abstraction bore, pipe network and storage tank for dust suppression.
Stage 6	Set up environmental monitoring stations and site office.
Stage 7	Ensure that all procedures, paperwork, health and safety documents have been signed off before project starts.
Stage 8	Excavate and remove identified clean sands to the clay substrate in the western portion of the site. This is to be the first cell to except the recycled remediated material. All site plant will also be on site at this stage.
Stage 9	Commencement of the remediation project in earnest. Through excavation, screening and processing of soil material.

4.3 Proposed Site Access

To allow the project Site to operate, access to the site has to be created. Current access to the site in the south west is via Adelaide Street. However, this is not a viable option as current on-going truck / transport vehicle access that has access to Adelaide Street, as it is considered that operational traffic would cause additional nuisance to the local community. The access proposed road location is shown on figure 2.

Therefore, Development application DA-791/2010 and DA-740/2010 was approved by the City of Swan in May 2012. This is for the construction and use of an access route to the site via Talbot Road (north of the site) (see figure 2). This has also been approved by WAPC. On-site roads will comprise the same construction methodology.

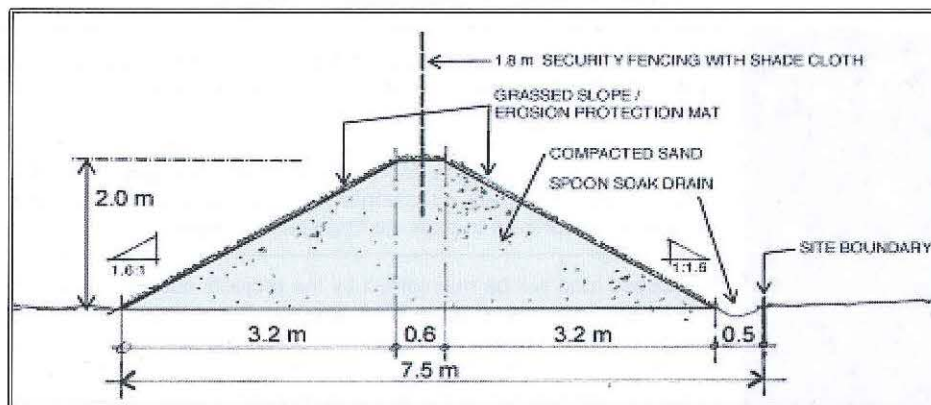
Table H: Road Construction Details

Construction Material	The construction of the access road will comprise limestone, aggregate and recycled bitumen for the composition. This will be rolled and engineered to accept anticipated site traffic under the construction design.
Dimensions	The proposed access road is approximately 335m in length (Talbot Road to North west corner of Site). The road will comprise a single lane access for one vehicle with the facility to allow vehicles to pass via three passing bays.
Maintenance	The access road will be maintained by the projects sites personnel. Operational tasks such as grading, sweeping, wetting down and repairing pot holes will be undertaken when required.
Volume of Traffic	<ul style="list-style-type: none"> • Traffic to the site will be minimal and periodic. Access is required for the work force daily. However, other traffic such as trucks carrying ASS and HIS material for the RFFF & SAAF will be on an ad-hoc basis when it becomes available. • Maintenance and refuelling trucks will also use the access road again this will periodic when it is required on site. • The material that cannot be used on site will require removal to a landfill facility, this will involve a truck leaving site periodically.
Surface Run off	The road will be cambered and graded to allow for surface run off to the verge (bush land).
Dust Suppression	Periodically the road will be suppressed for dust by a water tanker. Within the warmer, drier, summer months of the project the tanker will be deployed more frequently to ensure that dust generation is kept to a minimum.
Decommissioning Access Road	Upon completion of the project the road will be excavated and removed from its location. Validation of the underlying soils will be required to ensure that no impact has occurred.
Security	<p>A 1.5m high boundary fence made up of posts, metal mesh and shade cloth will be constructed along the length of the access road. This will provided physical control of unauthorised entry to the Site.</p> <p>Vehicle access will be controlled by a lockable gate located at the entrance of the Site.</p> <p>The entry gate is to be kept locked at all times when the premises are not attended by staff in order to prevent illegal dumping of waste materials.</p>

4.4 Site Boundary construction

A 1.8m high boundary fence will be constructed along the north, east and western boundary of the site. This will provide physical control and restrict unauthorised entry to the Site. Along the southern boundary of the site a 2.0m high earth bund with a 1.8m fence will be constructed (see diagram below).

The earth bund will be battered and compacted back to a 45° angle, root matting will be fixed in place and the bund will be seeded (grass) to allow for durability and stability. The bund and fencing will assist to improve security to the site, minimise/reduce any potential noise, dust impacts and reduce potential for contaminants moving off site. The perimeter fence will also reduce the visual and environmental impact of the works to residents on Adelaide Street.



Earth bund and fence construction for the Southern Boundary of the site (Adelaide Street).

4.5 Utilities

Power, telecommunications and potable water supply will be connected to the site offices for the duration of the project. The utility services will be laid along the new access road, with connections made via Talbot Road.

No Sewer connection will be required as the site will be serviced by a portable toilet block.

No Gas is required on site and therefore no gas supply will be installed.

Table I: Details of Utility Providers

Power	Western Power	13 10 87
Water	Water Corp	(08) 9424 8115
Telecommunication	Telstra	1800 810 443

4.6 Water Management and Use

MDWES presented a Ground Water Abstraction Plan (GWAMP) in the MDWES ESMP which is presented in supporting documents.

The Perth Groundwater Atlas (2003 contours) indicate that groundwater is encountered on average at approximately RL 14 to 16mAHD (DoE, 2004). The groundwater levels measured by MDWES from the four monitoring visits on site were noted to be between RL 19.2 - 23.6 mAHD with levels potentially varying by 0.1 – 0.8 m annually.

It is proposed that abstraction through a single pumping bore station located in the south west corner of the Site will be sufficient to supply the Site with its water needs. Three separate bores will be used for the proposed abstraction, pumping simultaneously within 30 m of each other.

The bore will be screened at the bottom of the Superficial Swan Aquifer with allowances for draw down being made. The applied licence and approval for the Site allows for pumping rates of 300 ML/yr (or 821.3 m³/day).

Table J: Summary of Groundwater Abstraction

No of Bores	X 3 (WRPB1, WRPB2, WRPB3)
Located	Southwest corner of Site
Aquifer	Superficial Swan Aquifer
Depth to Aquifer (RL)	21m (15mAHD) (DoE) - (Reported 19.2m to 23.6mAHD)
Depth of Water (RL)	10m (21mAHD) (DoE)
Base of Aquifer (RL)	31m (5.0mAHD) (DoE)
Pumped	Yes - groundwater pumps attached to each bore head. (1.5 kW Capacity).
Pumping Rates	Allowance 300 ML/yr = 821.3 m ³ / day
Metered	Yes – groundwater abstraction will be metered (Total of x3 wells).
Groundwater Quality	Yes – groundwater quality will be monitored through a monitoring program.
Storage	X2 - 50,000L above ground storage tanks connected to the dust suppression water disbursement system
Distribution	Stored groundwater will be distributed via tap and hose into the sites sprinkler system and demisting fan units.

4.7 Drainage

Wasterock will ensure that all stormwater up to a 1 in 10 year storm event is contained within the Site. All working areas will be graded appropriately to prevent run off from the Site. The approved bunding and fencing will act as a barrier and direct stormwater into appropriate filtration or drainage areas. If drains are built for this purpose, they will be inspected regularly and any material that could possibly block or inhibit stormwater flow will be removed immediately.

4.8 Dust Suppression

Section 4.6 details water management and the extraction of bore water being utilised on site. The abstracted water will service and supply the site with its water needs for dust suppression. The Site will adopt multiple dust suppression techniques to ensure the dust is kept to a minimum and suppressed during site operations and warmer climates observed in Perth. For the dumping of C&D waste at the crushing plant, there will be a beam-activated sprinkler which will dampen material during tipping into the RFFF area.

Table K: Adopted Dust Suppression Techniques

Suppression Technique	Description
Tankers	Tankers will be used to suppress access road (via Talbot Road) and internal site roadways.
Misting Machines	Misting machines will be constant at the face of the excavation, and on the screen deck and crushing plant areas.
Sprinklers	<p>A reticulation mainline will be connected to a sprinkler network from the on site storage tank for unrestricted use. The network will comprise the use of lay flat hose at source which will connect to a rigid PVC pipe network around the boundary away from excavation. This is to provide flexibility if a sprinkler needs to be moved, without re-establishing the network.</p> <p>This will allow for suppression on demand and if there is a fire. Sprinklers will be used when/where required and/or if a substantial volume of water is required at one time. In particular, stockpiled soil material.</p>

4.8.1 Misting System Details

Although stockpiles will be wet with sprinklers, misting units (fog cannons) will be sited in the work area as close as practicable to the workplace. This is to effectively control any emissions from excavation and screening processes. The fog cannons will provide efficient and effective dust suppression.

Hydraulic fog cannons are designed for low power and water use, combining a powerful fan with high launch efficiency of between 20m and 65m and can cover areas of up to 1,000 square metres. Micro nozzles mounted on individual crowns atomise water into billions of micro-fine droplets that readily bond to similar sized airborne dust particles, resulting in an extremely effective means of dust suppression.

Variable water flow allows the user to manage the volume of mist to suit the current conditions and the intensity of the dust present. Water use is reduced dramatically when compared to the amount of water employed by traditional irrigation systems, sprinklers and handheld hoses.

The misting technology effectively captures dust particles of PM₂₀ or less, significantly reducing breathable or fugitive dust in the surrounding air.

The benefits of using a misting system over conventional dust suppression are listed below. An image for the use of dust suppression is presented below also.

- Use significantly less water than traditional water sprinklers and hose systems.
- Limit muddy and boggy conditions/problems as there is minimal or no surface water present.
- Reduce clean up costs as the surrounding surface area has little moisture.
- Decrease machine maintenance costs by lowering equipment abrasion rates caused by dust.
- Improve workforce safety with an automated remote controlled system.

- Support local Council and EPA/DER regulations by significantly reducing dust emissions from business operations and facilitating compliance with ambient air quality standards



Images of a Mister/Fog Cannon

4.9 Excavation Progression

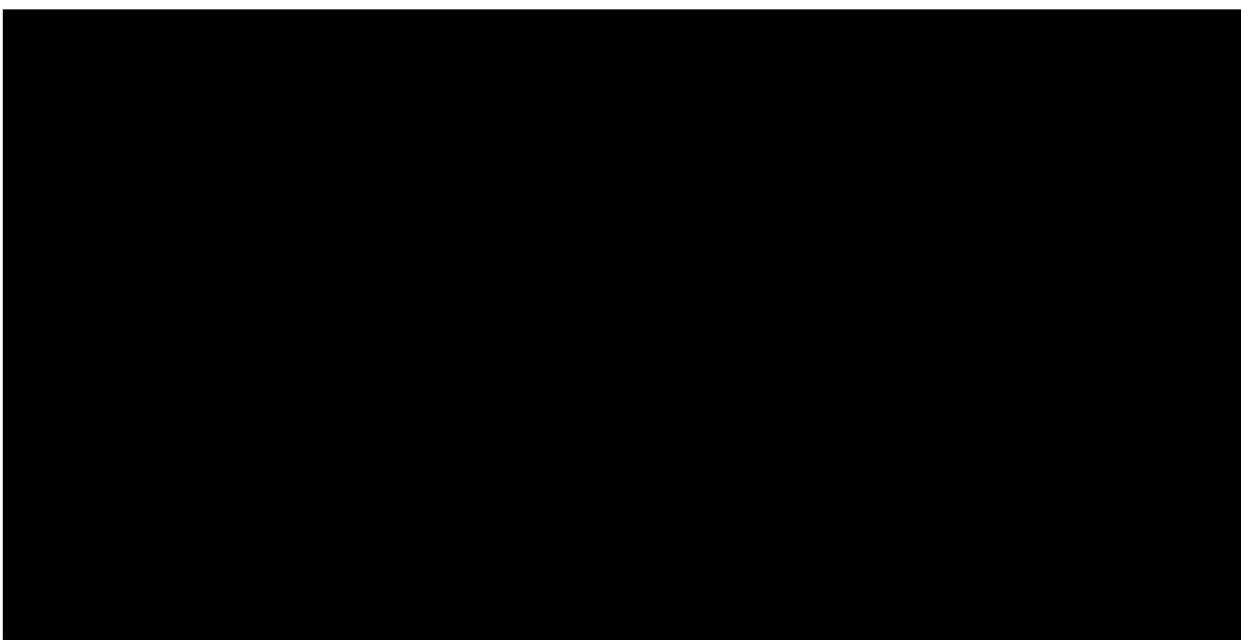
Wasterock propose to commence excavation in the western portion of the site mid-2014 and move in an easterly direction until the project is complete. The western portion of the site has been investigated and has been classified as clean sands, as no landfill operations have occurred in this area. The first phase of operations is to remove the clean sands, thus creating the first cell, ready to accept reinstated material.

Remedial works will lower the finished final level of the Site by removal of bulky materials such as concrete and brick, which will be crushed and used for the physical warning barrier layer.

Excavated materials such as concrete and masonry, metal and timber will be separated and reprocessed for reuse or recycling. If deemed unfit for use, they will be transferred to an appropriate licensed landfill facility. Recycling and remediation of bulky waste is expected to result in a significant volume reduction, which will be essential to achieve a finished landform level which conforms to adjoining finished contours.

4.10 Production of Engineered Fill

Wasterock's project remediation strategy aims to ensure that there is no risk, interim or long-term damage to the environment, ecology and/or human health, due to influence from the project Site.





4.10.1 Capping Layer

Wasterock proposes to cap the Site with a recycled sand layer with a minimum thickness of 1.5m. This sand will be processed through the SAAF recycling facility, which will accept HIS and ASS soil material (class 1) only. This material will be sourced externally from the Perth Metropolitan Area and will be certified as 'clean fill'.

Wasterock propose to commence excavation in the western portion of the site and move in an easterly direction until complete. The western portion sands have been deemed 'clean' and have not been impacted by landfill operations and so can be mechanically sorted and processed through the SAAF facility to provide volume to the capping layer as long as they are validated clean and certified.

4.10.2 Physical Barrier Layer

The RRRF will screen and process construction and demolition (C&D) waste (clean). This will supply significant volumes of clean recycled sand and clean crushable material. This will be rolled and considerably compacted to create a solid semi-permeable barrier layer.

The capping layer will be a minimum of 0.5m thick. Its main function will be to act as a drainage aggregate layer while also acting as a physical warning barrier to the recycled engineered fill processed material underneath.

4.10.3 Engineered, Repackaged Deep Cell

The deep engineered cell is designed to contain material resulting from the reprocessing of excavated landfill material. The deep cell will be compacted for geotechnical-engineering purposes. Asbestos-impacted fill material recovered from the remediation will be placed into the deep cell and will be equal to or greater than 3 metres below finished level (mbfl).

Other waste materials that pose no risk of leaching contaminants into the groundwater system and are geotechnically suitable will also be placed at depth on-site as foundation material, following processing. It should be noted that the deep cell will be free from putrescible waste and organic green waste which could give rise to the potential generation and accumulation of landfill gases.

4.11 Required Soil Stream Volumes

It is expected that during the life span of the project, Wasterock will process up to 1500m³ of landfill material per day. A compaction factor of 1.5 (sand) has been applied to the volumes of soil to remediate the site.

Therefore, depending on the depth of the parcel of land, the estimated required volume of soil needed to repackage the site is estimated to be 1.62million m³ (volume totals for capping, break and deep cell layers). This is shown on Table L below.

Table L: Required Soil Volumes

Material	Intended Location	Depth	Volume ² (LxWxD)	Compaction Factor	Estimated Volume Required
ASS & HIS	Capping	1.5	254,250	x1.5	381,375
C & D	Break Layer	0.5	84,750	x1.5	127,125
Recycled Landfill	Deep Cell ¹	4.5	762,750	x1.5	1,144,125

¹: Current Depth of Clay substrate has been reported to 6.5mbg. (additional volumes may be required is the landfill is deeper).

²: Site area is 565m (length) x 300m (Width).

4.12 Storage of Processed Material

The proposal includes the provision for several movable concrete-bunded bunkers which will hold processed soil material. The bunkers will hold approximate 8 tonne of soil with a dimension of 5m (W) x 1m (L) x 1m (H).

The bunkers will be located in close proximity to the screening deck to allow for any validation or analysis required on the soil before re-use or storage. Stored stockpiled soils will be suppressed using water misters on site.

Crushed concrete and brick material will be transported from the excavation face to the crushing plant to be processed (RRRF). The crushed C&D will be stored on-site in bunded bunkers until required.

4.13 Vehicle Parking

During the initial stages and site set up, before the site becomes operational, a temporary car park will be positioned in the south-west corner of the site. Access will be via Adelaide Street (this may be subject to change). Once the site becomes operational a semi-permanent car park will be constructed on the northern boundary, next to the site compound. Access to the compound car park will be via a installed access road (See section 4.3) from Talbot Street to the north of the subject site.

The car park construction will use rolled aggregate/limestone. The car park will only be used for site personnel vehicles and small delivery trucks. For further details the Wasterock SMP should be consulted in the supporting documents.

4.14 Fuel Handling

Fuel for plant and machinery will not be stored on site. All fuel will be delivered as required by a mobile fuel contractor. All plant/trucks and machinery will be re-fuelled at their location within the site boundary.

Any fuel spillage will be immediately addressed and an environmental investigation and report will be conducted followed by required remediation and validation. Outcomes of the investigation may result in the re-writing of operational procedures for re-fuelling and/or fuel handling, to ensure no additional incidents and/or environmental impacts occur.

Fuel and chemical handling will be in accordance with the current Australian Standards for the storage and handling of flammable and combustible liquids under the Dangerous Goods Safety Act 2004 and associated Dangerous Goods Safety Regulations 2007.

This is administered by the Department of Mines and Petroleum and includes the following associated guidelines.

- AS4452 - the Storage & Handling of Toxic Substances.
- AS1940 - the Storage & Handling of Flammable and Combustible Liquids.
- AS3740 - the Storage & Handling of Corrosive Substances.

The appropriate Material Safety Data Sheets (MSDS) of all chemicals used on site will be kept in a register.

4.15 Vehicle Maintenance

A portable movable structure will be located within close proximity of the works excavation face to maintain the vehicles. It will be located at the most northerly point, away from the residents of Adelaide Street to ensure reduced impact. On-site plant maintenance will be undertaken by a contractor.

Light commercial vehicles will be kept within the Site's car park/works compound on the northern boundary. All large plant equipment will be kept at the face of the excavation whilst the project progresses.

4.16 Vehicle Wash

Site plant equipment and vehicles will be washed down regularly in the work area with a low volume pressurised water jet system. Any soil matter will be retained within the Site area. Water runoff will benefit dust suppression in the area. Vehicles will remain in their designated areas to reduce any environmental impact.

4.17 Vehicle Load Acceptance

Vehicles used for the transportation of materials from external sources to the Site will be inspected when arriving at Site by the on-site Manager who will also check each load of incoming material before it is tipped into the RRRF or SAAF (Note: ESMP 12.4 Soil Tracking). Each incoming truck of soil (ASS and Class 1) will be checked by the Site Manager or his representative to classify material prior to deposition on-Site. Laboratory soil analysis will be required for soil from each individual off-site soil source. Only soil from off-site locations with validated certificated laboratory analyses will be accepted to Site.

In the unlikely event that asbestos or other unsuitable material is encountered, the following procedures will apply:

- Tipper will be instructed to remove the material immediately.
- Site manager will reload the offending customer with the material.
- Customers will receive one warning only, and then be prevented from using the Site.

The customer will be responsible to remove and dispose of the unsuitable material offsite to an appropriately licenced landfill facility.

5 POLICY FRAMEWORK

The Environmental Protection Act 1986 (EP Act) is the primary legislation dealing with the protection of the environment in Western Australia. It provides for an Environmental Protection Authority (EPA), for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the above.

The EP Act establishes a waste hierarchy for Western Australia and provides a list of management options in the following order of preference.

- Avoidance
- Reuse
- Recycle
- Recovery of Energy
- Treatment
- Containment
- Disposal

Implementation of State Environmental Policies (SEPs) and Environmental Protection Policies (EPPs) will also ensure that the natural environment is sustained. Therefore, the range of different uses and values that the natural environment can support is managed in an integrated manner.

Parts IV and V of the EP Act discuss 'Environmental Impact Assessment' and 'Environmental Regulation', respectively.

The Department of Environment Regulation (DER) regulates prescribed premises under Part V of the EP Act (1986). See table C within this report, Section 2.4. Part V of the EP Act requires the occupier of premises to obtain a Works Approval when undertaking works which would cause the premises to become a prescribed premises. For established prescribed premises, the EP Act specifies when a Works Approval is required for a range of actions that may alter emissions or alter the operation of the premises.

The purpose of a Works Approval is to ensure that premises plant and equipment are designated, sited and can be managed so that emissions from the site are environmentally acceptable.


Prescribed premises are listed in Schedule 1 of the *Environmental Protection Regulations 1987*.

A licence is also required under Part V of the EP Act to prevent, reduce or control particular emissions and discharges, including noise and odour, or to the monitoring or recording of them. A licence is required prior to discharging, emitting noise and/or for the treatment or storage of prescribed industrial waste from the scheduled premises and commissioning of any works subject to a works approval.

These documents constitute the Works Approval Application (WAA) and licence application, and include technical information relevant to the remediation, screening, crushing, excavation and storage of material. Further comment is drawn on the environmental aspects of the application with includes 'greenhouse gas emissions (GHGs)', 'noise', 'odour' and 'dust' for the project Site. Additional comment has been provided by an environmental lawyer with the regard to the classification of the site and its use and role as a remediation project. A copy of the letter is provided in Appendix A.

5.1 Moving Zero Waste Streams

The Project will involve the reprocessing and recycling of an inert land development as part of a sustainable program. Construction waste material generated from developments specifically within the Perth Metropolitan area will be utilised and accepted at the SAAF and RRRF facilities on site. The volumes of soil generated would otherwise have been disposed of at a licensed landfill.



It is important for the proponents of projects to help the Western Australian community shift to a low-waste society which is the objective of the Western Australian Waste Strategy (Waste Authority 2012).

5.2 Environmental Protection Policy

Environmental Protection Policies (EPPs) are statutory policies in a framework which is developed under Part III of the *Environmental Protection Act 1986* (EP Act). They are whole-of-Government policies that are ratified by Parliament and have the force of law from the day they are published by the Western Australian Government. EPPs are developed, for instance, to establish environmental values and environmental quality objectives for a particular environment or component of the environment.

5.3 State Environmental Policies

State Environmental Protection Policies (SEPs) are non-statutory policies developed by the EPA under Part II, Section 17(3)(d), of the EP Act. They are considered by Cabinet for adoption on a whole-of-Government basis.

A SEP, being non-statutory, is a more general and flexible instrument than an EPP. However, both documents can establish environmental values and environmental quality objectives for a particular environment or component of the environment. Implementation of SEPs is primarily through the powers of the EP Act, including environmental impact assessment, industry licensing, clearing regulations and environmental harm and pollution provisions.

5.4 Part V, Sections 52 and 53

Part V of the *Environmental Protection Act 1986* (the Act) requires the occupier of a premises to obtain a works approval when undertaking works which would cause the premises to become a prescribed premises.

The purpose of a works approval is to ensure that premises, plant and equipment are designed sited and can be managed, so that emissions from the premises are environmentally acceptable.

Section 52 of the Act makes it an offence to do work on or in relation to a premises, which would cause it to become, or become capable of being, a prescribed premises, unless in accordance with a works approval.

Section 53 of the Act makes it an offence under various circumstances to carry out certain works without a works approval.

5.5 Air Quality

An Air Quality Assessment & Management Plan has been commissioned as part of the MDWES EMSP report. However, policies relating to air quality management are presented below based on the (draft) State Environmental (Ambient Air) Policy 2009

The purpose of the Ambient Air SEP is to provide all Western Australians with air quality that is protective of human and environmental health and amenity. The Ambient Air SEP will allow any significant sources of air pollutants in WA to be managed in order to meet the environmental quality criteria. This involves the management of not only the large, individual point sources but also the small, dispersed non-point sources that collectively contribute to episodes of unacceptable air quality in an area or region. This includes dispersed emissions from motor vehicles, stationary fuel combustion and land management activities. It should be noted that the Ambient Air SEP is applicable to air quality outside enclosed structures and is not intended to manage indoor air quality or air quality in an occupational setting.

The Policy aims to:

- (a) Establish the basis on which ambient air quality is to be protected;
 - Establish, protect and maintain the environmental value of ambient air;
 - Establish and give effect to the environmental quality objectives and the environmental quality criteria for an approved ambient air related National Environment Protection Measure; and
 - Provide the basis for establishing and giving effect to environmental quality criteria for local pollutants as identified by the Chief Executive Officer.
- (b) Abate pollutants and restrict activities that diminish the environmental value of ambient air; and
- (c) Establish a framework and program to protect and enhance environmental quality to support the environmental value of ambient air.

The Department of Environment Regulation's, *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities* (2011), supersedes EPA Guidance No 18 – *Prevention of Air Quality Impacts from Land Development Sites* provides guidance on preparing a plan for the management of dust and associated contaminants arising from various activities including land clearing for development, remediation of contaminated sites and bulk materials handling and storage.

5.6 Water

The Rights in Water and Irrigation Act 1914

The Department of Water is responsible for managing the state's water resources. By issuing licences and permits under the *Rights in Water and Irrigation Act 1914 (RIWI)*, the Department protects the state's water resources and promotes the sustainable and efficient use of water. The objects of the Act include:

To provide for management of water resources, and in particular -

- i) for their sustainable use and development to meet the needs of current and future users; and
- ii) For the protection of their ecosystems and the environment in which water resources are situated, including by the regulation of activities detrimental to them;. (Section 4 (1)).

State-wide Policy no.5: Environmental Water Provisions Policy (2000), under the Environment Protection Act 1986, protects ecological values in the allocation process, determines ecological water requirements and develops environmental water provisions. This policy describes the

approach to be followed by the Water and Rivers Commission in determining how water will be provided to protect ecological values when allocating the rights to use water in Western Australia.

The policy lists the guiding principles to be followed when making such decisions and outlines a water allocation planning framework in which these principles are to be applied. The policy also describes the relationship between the Commission's approach to water resources planning and management processes under the provisions of the *Rights in Water and Irrigation Act 1914* and the Environmental Protection Authority's responsibilities under the provisions of the *Environmental Protection Act 1986*.

5.7 Soil

The *Contaminated Sites Act 2003* (WA) was passed in November 2003 and the Contaminated Sites Regulations were gazetted on 8 August 2006.

The Act complements the *Environmental Protection Act 1986* (WA) by establishing a framework for the identification, management and remediation of contaminated land and groundwater in Western Australia. It provides a legal framework for reporting, assessment and management of contaminated sites. The Department of Environmental Regulation (DER) administers the Act, but the Environmental Health Directorate of the Department of Health of WA provides DER with advice on the public health aspects of contamination. The Act defines a site as 'contaminated' where there is a "substance present in or on that land, water or site at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or an environmental value".

The DER has produced *Contaminated Sites Guidelines*, which will be used in conjunction with the recently amended *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM). The Department of Environmental regulation (DER) will be incorporating the amended NEPM in its guidelines and/or gazetting the NEPM schedules as guidelines under s.97 of the *Contaminated Sites Act 2003*.

The (former) Department of Environmental Protection (DEP) has also produced a *Contaminated Sites Management Series*, which is now regulated by DER. The Series lists numerous guidelines including "Assessment Levels for Soil, Sediment and Water", "Guidelines for the Acceptance of Solid Waste to Landfill", "Bioremediation of Hydrocarbon-Contaminated Soils in Western Australia", "Potentially Contaminating Activities, Industries and Landuses" and "Guidelines for the Remediation and Management of Asbestos-Contaminated Sites in Western Australia".

5.8 Energy Efficiency Greenhouse Gas Emissions

EPA Guidance Statement Number 12, "Minimising Greenhouse Gases", specifically addresses the minimisation of greenhouse gas emissions from significant new or expanding operations.

In addition, National Greenhouse Accounts (NGA) Factors have been prepared by the Commonwealth Department of Climate Change and Energy Efficiency and is designed for use by companies and individuals to estimate greenhouse gas emissions. The methods for calculating emissions listed in this document are "Method 1" from the National Greenhouse and Energy Reporting (Measurement) Determination 2008, incorporating the National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2013 (No. 1) and the National Greenhouse and Energy Reporting (Measurement) Technical Guidelines July 2013.

The default emission factors listed in the NGA have been estimated by the Commonwealth Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education using the Australian Greenhouse Emissions Information System (AGEIS) and are determined simultaneously with the production of Australia's National Greenhouse Accounts.

This ensures that consistency is maintained between inventories at company or facility level and the emission estimates presented in the National Greenhouse Accounts. The emission factors are referred to in this document as National Greenhouse Accounts default emission factors.

5.9 Noise

The Department of Environment Regulation (DER) regulates noise from large industries, develops and implements noise policy, reviews and provides advice on noise issues for major projects and provides support to local governments dealing with noise complaints.

Draft EPA Guidance Number 8 'Environmental Noise', deals with the assessment of environmental noise emissions, where those emissions come under the Environmental Protection (Noise) Regulations 1997, or other relevant acceptable standards.

Regulation 13 of the Environmental Protection (Noise) Regulations 1997, 'Construction sites', Division 2, Regulation 7 does not apply to noise emitted from a construction site as a result of construction work carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday if the occupier of the premises or public place, shows that —

- (a) The construction work will be carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites.
- (b) The equipment used on the premises will be the quietest reasonably available.
- (c) If the occupier was required to prepare a noise management plan under sub-regulation (4) and (5A) in respect of the construction site:
 - (i) The noise management plan would be prepared and given in accordance with the requirement, and approved by the CEO.
 - (ii) The construction work would be carried out in accordance with the noise management plan, excluding any ancillary measure.

A Noise Management Plan is included as part of this report and the Site Environmental Management Plan (ESMP by MDWES) which includes, but is not limited to:-

- (a) Details of, and reasons for, construction work on the construction site.
- (b) Details of, and the duration of, activities on the construction site likely to result in noise emissions that fail to comply with the standard prescribed under regulation 7.
- (c) Reductions of noise emissions on the construction site.
- (d) Details of measures to be implemented to control noise (including vibration) emissions
- (e) Procedures to be adopted for monitoring noise (including vibration) emissions
- (f) Complaint response procedures to be adopted.

In addition, if any noise emissions received are identified as likely to fail to comply with the standard prescribed under Regulation 7, written notice of the proposed construction work will be given to the occupiers of all adjacent premises.

A review of the Noise Management Plan would be required for any non-conformance.

5.10 Odour

The EPA has set criteria in its Guidance Statement No 47 *Assessment of Odour Impacts from New Proposals* (EPA, 2002) for new proposals and expansions of existing facilities. Odour criteria for existing facilities will differ depending on the situation. It is not anticipated that odour will be a issue on the site. However it has been addressed as part of this WAA report.

The EPA Guidance allows that odour measurement may be used for assessment of a range of situations including:

1. Proposals for a new and expansion of an existing odorous facility.
2. Proposals for sensitive land use near an existing odorous facility.
3. Investigation of complaints to the DEP of odour from existing facilities.
4. Setting of licence conditions.
5. Buffer definition studies where surrounding land is not yet zoned for urban use.
6. Assessing odour during contaminated site remediation.
7. Determination of odour emission rates before and after a plant upgrade in order to quantify emission reduction.

The (former) Department of Environmental Protection (DEP) produced an *Odour Methodology Guideline* (2002), which considers the appropriate methods for measuring odour concentration to be:

- The Dutch Standard NVN 2820 "Air Quality, Sensory odour measurement using an olfactometer", March 1995.
- Comité Européen de Normalisation, "Odour Concentration measurement by dynamic olfactometry, CEN TC264/WG2 'Odours' Final WG2 Draft prEN", 1995; or
- Australian Standard 4323.3:2001 *Stationary source emissions - Determination of odour Concentration by dynamic olfactometry* (Note: the Australian Standard has been based on the CEN standard).

The German Standard VDI 3882 Part 1, "Olfactometry Determination of Odour Intensity", October 1992 should then be used for the subsequent odour intensity calculations.

A review of the odour management plan would be required for any non-conformance

6 RESOURCE RECOVERY & REMEDIATION FACILITY

To assist in the remediation of the site, plant is required to process and repackage material, as well as to source other material from other sites. Materials will be processed by a crushing plant and screening deck. The following sections provide further specification and information with regards to processes, inputs and outputs. The location of the RRRF is shown on figure 4.

6.1 Inputs & Outputs

Inputs of material to the Site would contain the following inert materials for recycling and reuse in the construction of the repackaged land. Approximate annual intakes:

- Sand, limestone and concrete – approximately 30,000 ton/year.
- Construction and demolition waste – approximately 60,000 ton/year.


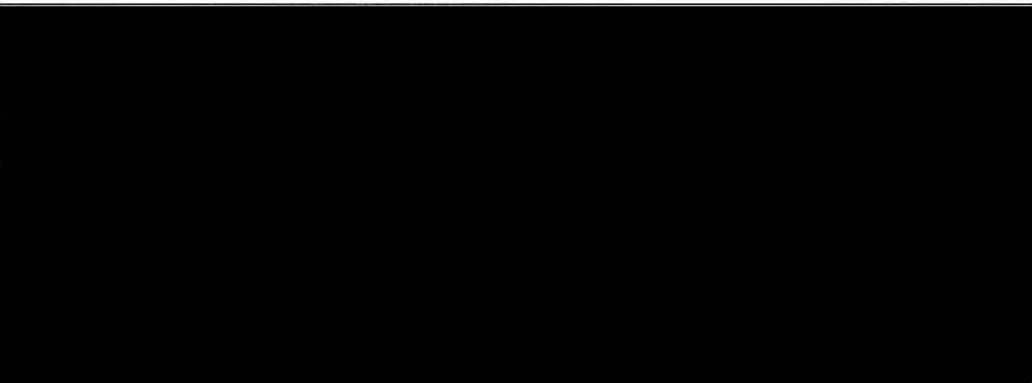
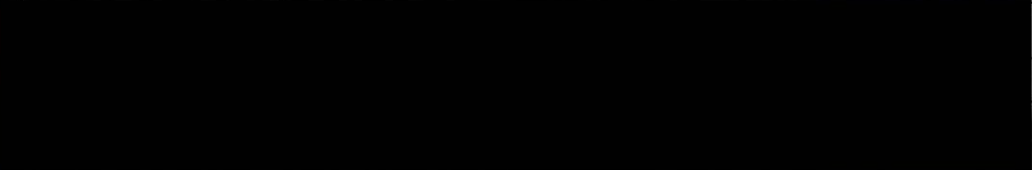
As the site does not have enough suitable material to use as the capping layer, to allow the site to be remediated, waste material will be sourced from approved suppliers in the construction industry from the Perth Metropolitan area. This will allow for greater confidence that the waste material will not include asbestos or other contaminants. Products that will be taken from accredited sources and suppliers include:

- bitumen
- limestone
- asphalt
- concrete
- brick waste
- builders rubble
- ASS / HIS impacted soils
- sand, gravel,
- demolition rubble

6.2 Crushing Plant

It is anticipated that a large volume of construction and demolition waste (C&D) will be utilised for the break layer/barrier between the repacked deep cell and the clean capping layer. The following plant will be used to process this material.

Table M: Description of Crushing Plant

	Description
Image	
Location	The crusher will be sunk into a constructed pit, positioned within the site compound along the northern boundary of the site.
Name	
Model	
Dimensions	
Mass	
Crushing Capacity	
Output	
Operation hours	As required between 9:30am and 4:30pm weekdays.
Operation Frequency	Average 3-4 hours per day, 6-8 days per month. Equates to ~12% operational capacity (based on operational hours - Table D).
Operational Personnel	
Power pack	
Fuel Consumption	
Noise (dBA)	At 5 metres running unloaded L_{A10} ¹ 87 dB, running loaded estimated L_{A10} 97 db.
Receptor Noise (dBA)	Nearest receptor ~280 metres away, allowing for +5 dB pulsing, noise decay -35 dB [\log_{10} (distance/5) dB], barrier attenuation across the site -20 dB (separate cutting & embankment), plus a noise influencing factor ¹ . Therefore, noise levels from source at nearest receptor equals L_{A10} 47 dB (See figure 7 for diagram and expanded calculation).
Dust Suppression	Not built in. This will be controlled by wetting down the feed through misting machines/sprinklers.
Odour	It is not envisaged that Odour will be a problem from the waste streams being processed.

¹ A +3 dB noise influencing factor from roads (Roe Hwy & Stirling Cres) has been applied to assigned L_{A10} level for receptors. This has been adopted due to noise sensitive premises within 15 metres of a building directly associated with a noise sensitive use between 0700 and 1900 hours Monday to Saturday this tolerable noise limit equates to 47 dB L_{A10} .

Operational crusher noise derived from Hitachi HR320G specifications. Noise distance decay and barrier attenuation is in accordance with basic acoustical principle of hemispherical radiation described in Noise Impact Assessment – Proposed Soil Remediation activities, as per BS 5228-1. Impulsiveness and influencing factor applied are as per DEP Environmental Protection (Noise) Regulations 1997.

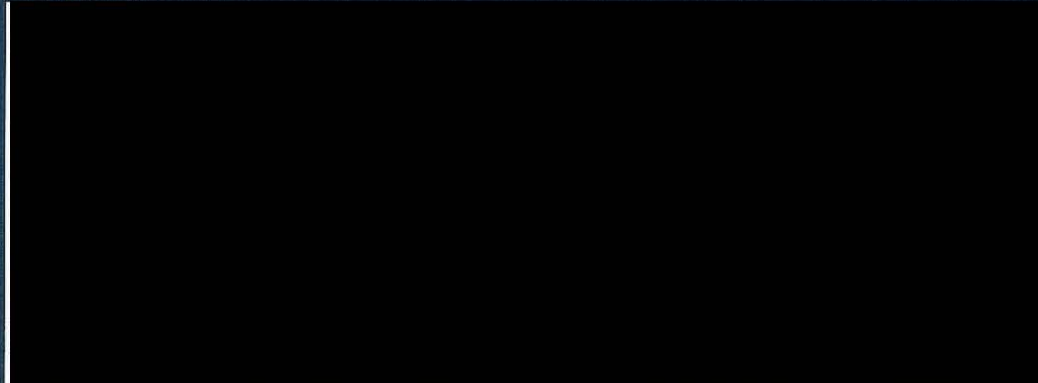
MDW Environmental Services

Job # E2012-031 Works Approval Application v2 – Wasterock, Hazelmere

6.3 Screening Plant

The excavated historical on-site material will be processed through the screening plant deck. The following plant will be used to process this material into sized components for recycling and re-use.

Table N: Description of Screening Deck

	Description
Image	
Location	Excavation zone – However, will not be positioned less than 100m from residential Receptors. (The plant will be positioned close to the excavation face and will move with the remediation).
Name	
Model	
Dimensions	
Mass	
Screening Capacity	
Output	
Operation Hours	As required between 7 am and 5:30 pm weekdays, 8 am and 4 pm Saturdays.
Operational Personnel	
Operation Frequency	Average 6 hours per day, 6 days per week, equates to ~61% operational capacity (based on operational hours - Table D).
Power Pack	
Fuel Consumption	
Noise (dBA)	At 10 metres running loaded estimated L_{Aeq} 84 dB.
Receptor Noise (dBA)	The crusher is mobile the closest it will be positioned to the receptor is 100 metres away, no allowance for impulsiveness or tonality is given. Noise decay 26dB [\log_{10} (distance/5) dB], barrier attenuation 10 dB (embankment), plus a noise influencing factor ¹ . Therefore, noise levels from source at nearest receptor equal L_{A10} 48dB (See figure 9 for diagram and expanded calculation).
Dust Suppression	Not built in. This will be controlled by wetting down the feed through misting machines.
Odour	It is not envisaged that Odour will be a problem from the waste streams being processed.

¹ A +3 dB noise influencing factor from roads (Roe Hwy & Stirling Cres) has been applied to assigned L_{A10} level for receptors. This has been adopted due to noise sensitive premises (residents) within 15 metres of a building directly associated with a noise sensitive use between 0700 and 1900 hours Monday to Saturday this tolerable noise limit equates to 47 dB L_{A10} .

Operational crusher noise derived from Hitachi HR320G specifications. Noise distance decay and barrier attenuation is in accordance with basic acoustical principle of hemispherical radiation described in Noise Impact Assessment – Proposed Soil Remediation activities, as per BS 5228-1. Impulsiveness and influencing factor applied are as per DEP Environmental Protection (Noise) Regulations 1997.

6.4 Heavy Duty Separator

Wasterock Pty Ltd. have been researching and investigating the use of a heavy duty separator using specific gravity to separate the waste. The viability and suitability is still being decided by the client. However, the following has been included as an overview of the process.

Table O: Heavy Duty Separator

Image	Description
Location	Compound
Name	
Model	
Dimensions	
Mass	
Screening Capacity	
Output	
Optional Separation	Addition separators can be used to class floats e.g. with SG of 2.6 metals can be removed from bricks and concrete
Operation Hours	As required between 7 am and 5:30 pm weekdays, 8 am and 4 pm Saturdays
Operational Personnel	
Operation Frequency	Undetermined, if utilised its likely to be similar to screening plant usage with average 6 hours per day, 6 days per week, equates to ~61% operational capacity (based on operational hours – Table D)
Power Pack	
Fuel Consumption	
Noise (dBA)	Undetermined, likely to be less than screening plant and $<L_{Aeq}$ 84 dB
Receptor Noise (dBA)	<p>Nearest receptor variable 280 metres away, no allowance for tonality, modulation or impulsiveness. Noise decay +35 dB $[20 \log (\text{distance}/5) \text{ dB}]$, barrier attenuation 20 dB (separate cutting & embankment), noise level at nearest receptor equals L_{A10} 29 dB</p> <p>Nearest receptor 280 metres away, an allowance +5 dB pulsing. Noise decay -35 dB $[\log_{10} (\text{distance}/5) \text{ dB}]$, barrier attenuation across the site +20 dB (separate cutting & embankment), plus a noise influencing factor¹. Therefore, noise levels from source at nearest receptor equals L_{A10} 47 dB.</p>
Dust Suppression	All product wet down via quiescent bath and rinsing
Odour	Not applicable

7 SOIL ACCEPTANCE & AMENDMENT FACILITY

The Soil Acceptance & Amendment Facility (SAAF) will accept and amend ASS soil and Class I (HIS) soils. The SAAF is detailed on figure 4.

Accepted soils are to be amended and treated before use as capping material as part of the remediation project.

Table P: Description of Soil Amendment Area

Image	Description
Location	The soil amendment facility will be positioned on the eastern boundary of the site. Access will be via a service road along the northern boundary of the site. (See figure 4).
Name	Soil Amendment Facility.
Model	15-35 tonne Kamatsu or CAT excavator will be used to rotate the soils.
Dimensions	300m in length, (north to south) / 50m in width (East West) and 400mm in height.
Approximate Volume of Lime Required	To create the soil amendment area a limestone pad a volume of approximately [REDACTED] of lime is required.
Soil Capacity	At any one time approximately 5000m ³ of ASS or HIS impacted soils could be processed. This allows for storage and movement of plant to rotate the HIS windrows.
Operational Personnel	[REDACTED]
Power input	Solar energy to volatilise the HIS impacted soils.
Odour	A hydrocarbon malodour may be present during volatilisation. It is unlikely that this will impact residential receptors in Adelaide Street. However this will be assessed as part of the environmental monitoring.

8 ENERGY USE AND GREEN HOUSE GAS EMISSIONS

8.1 Greenhouse Gas Emission Assessment Framework

In the case of this proposal, the EPA Guidance No 12, Minimising Greenhouse Gases would expect reporting on the emissions of:

- carbon dioxide (CO₂).
- methane (CH₄).
- nitrous oxide (N₂O).

In terms of their "carbon-dioxide equivalent" (CO₂-^e).

The "carbon dioxide equivalent" is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor published by the Intergovernmental Panel on Climate Change (IPCC).

The National Greenhouse Accounts (NGA) Factors (July 2013) has been prepared by the Commonwealth Department of Climate Change and Energy Efficiency and is designed for use by companies and individuals to estimate greenhouse gas emissions. The default emission factors listed have been estimated by the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education using the Australian Greenhouse Emissions Information System (AGEIS) and are determined simultaneously with the production of Australia's National Greenhouse Accounts. This ensures that consistency is maintained between inventories at company or facility level and the emission estimates presented in the National Greenhouse Accounts. The emission factors are referred to in this document as National Greenhouse Accounts default emission factors or "NGA Factors".

The principle greenhouse gas generated by the combustion of fossil fuels for energy is carbon dioxide. The quantity of gas produced depends on the carbon content of the fuel and the degree to which the fuel is fully combusted (i.e. the oxidation factor, which usually ranges between 98% and 99.5%). Very small quantities of methane and nitrous oxide are also produced, depending on the actual combustion conditions.

Fuels used for transport purposes produce slightly different methane and nitrous oxide emissions than if the same fuels were used for stationary energy purposes. However, for the purposes of this document, the differences were seen as insignificant and fuels are used for general transport purposes. A range of optional emission factors are provided for use with post-2004 vehicles and heavy vehicles conforming to Euro design standards.

The greenhouse gas emissions assessment for this project takes into account the following data:

- The National Greenhouse Accounts (NGA) Factors (July 2013) estimated diesel and electricity consumption by mining operation.
- Estimated diesel consumption during transport of material to and from Perth.
- Estimated fuel consumption from on-site plant equipment.

Estimates of emissions from the combustion of individual fuel types are made by multiplying a (physical) quantity of fuel combusted by a fuel-specific energy content factor and a fuel specific emission factor. This is performed for each relevant greenhouse gas (in this case, carbon dioxide, methane and nitrous oxide (as CO₂-^e).

The following formula can be used to estimate greenhouse gas emissions from the combustion of fuel for transport energy purposes.

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

where:

E_{ij} is the emissions of gas type (j), carbon dioxide, methane or nitrous oxide, from fuel type (i) (CO₂-e tonnes).

Q_i is the quantity of fuel type (i) (kilolitres or gigajoules) combusted for transport energy purposes

EC_i is the energy content factor of fuel type (i) (gigajoules per kilolitre or per cubic metre) used for transport energy purposes.

If *Q_i* is measured in gigajoules, then *EC_i* is 1.

EF_{ijoxec} is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO₂-e per gigajoule) used for transport energy purposes

NGA factors for diesel oil combustion in post-2004 vehicles are:

Energy Content Factor (*EC_i*) = 38.6 GJ / kL

Emissions Factor (*EF_{ijoxec}*) = 69.2 kg CO₂-e / GJ

8.2 Estimation of Energy Consumption

Predicted onsite diesel use for the project is presented on Table Q.

Table Q: Estimate Onsite Diesel Use

Project Equipment / Plant	Number of vehicles on site	Consumption (Med Load	Annual Fuel Use (L/yr) 313 days ie 3130 hrs
Loaders 15 to 35 tonne (Kamatsu / CAT)	3	20L/hr (CAT 980H)	206,600
Excavators 15 to 35 tonne	4	30 L/hr (330 CAT)	368,000
Water Truck 12 Tonne	1	30 L/hr (CAT 769)	368,000
Compactor (Terex TC400)	1	Assume same as CAT 815F	80,480
Compactor (13 Tonne CAT)	1	26 L/hr (815F)	80,480
Separator (CAT C9)	1	58.3 L/hr	182,400
Crusher (Terex 1175)(CAT C9)	1	58.3 L/hr	182,400
Screen (Terex Reclaimer 883)	1	18 L/hr	56,300
Screening Deck (Deutz)	1	15kL/yr (BF4M2010)	15,000
CAT D 10 Dozer	1	(D10T) 70L/hr	219,100
Light commercial vehicles (Av 25km/day)	2	1 L/hr	6,260
Total			1,765,020

This is based on a operation 8 hr day, for a 6 day week, Total 303 operational days a year (WA public holidays & Sundays have been taken into account).

NB: A conservative annual fuel use has been calculated for each vehicle.

8.3 Estimation of Greenhouse Gas Emissions

The remediation and regeneration project will consume an estimated 1765kL of automotive diesel for transport purposes.

Therefore, the emissions of greenhouse gases (carbon dioxide, methane and nitrous oxide) in tonnes of CO₂^{-e} are estimated as follows;

Emissions of CO₂^{-e}

$$= (1765 \times 38.6 \times 69.2)/1,000 = 4714 \text{ t CO}_2^{-e}$$

Emissions of methane:

$$(1765 \times 38.6 \times 0.2)/1,000 = 14 \text{ t CO}_2^{-e}$$

Emissions of nitrous oxide:

$$(1765 \times 38.6 \times 0.5)/1,000 = 34 \text{ t CO}_2^{-e}$$

Total scope 1 GHG emissions

$$= 4714 + 14 + 34 = 4762 \text{ t CO}_2^{-e}$$

Direct GHG emissions from this project are estimated to be 4762 t of carbon dioxide equivalent / year. This represents 0.006% of the 77.1 million tonnes (2009) of GHG emissions for Western Australia.

8.4 Measures to Reduce Greenhouse Gas Emissions

The EPA's environmental objective for greenhouse gas management is to reduce emissions to a level which is as low as is practicable. To achieve this the EPA's environmental assessment objective is to ensure that potential greenhouse gas emissions emitted from proposed projects are adequately addressed in the planning/design and operation of projects.

This project will ensure that best practice is applied to maximise energy efficiency and minimise emissions, including:

- Installation of direct driven equipment in lieu of belt driven systems, where this is technically feasible, to avoid energy wastage on mechanical conversion elements
- Locating infrastructure with high loads as close as possible to power lines to reduce line loss on Site.
- Ensuring that Site plant and equipment is correctly sized for work and production requirements.
- Minimising the size of the plant/vehicle fleet.
- Minimising haulage distances.
- Minimising abstraction requirements and hence pumping energy required by minimising pit length for dust suppression.
- Ensuring that vehicles and equipment are mechanically sound, regularly serviced and fitted with appropriate emission control equipment.
- Integrating processes to reduce soil movement to a minimum where possible, to minimise stockpile handling.

- Controlling compound lights through timers and fitting low-energy florescent lamps in the site compound and offices.
- Installing video conferencing facilities at the site and using these facilities for external communication in preference to travelling to meetings, thus reducing the travelling distance.
- Working with third parties to reduce emissions (i.e: suppliers, distributors, and contractors).

8.5 Energy Assessment

Electricity use and diesel consumption will be monitored throughout the project life span so that green house gas emissions can be monitored. This will enable additional sources of greenhouse gases to be identified and for the implementation of new economically-viable opportunities to reduce greenhouse gas emissions.

References

ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ).

Davidson, W.A. (1995) *Hydrogeology and Groundwater Resources of the Perth Region Western Australia*. Geological Survey of Western Australia. Department of Minerals and Energy.

Davidson, WA and X Yu (2006). *Perth regional aquifer modelling system (PRAMS) model development: Hydrogeology and groundwater modelling*, Western Australian Department of Water, Hydrogeological series HG20.

Department of Environment (DoE) 2003, *Assessment Levels for Soil, Sediment and Water*. Contaminated Sites Management Series, Department of Environment, 168 St Georges Terrace, Perth WA 6000.

Department of Environmental Protection (2000). *Annual Summary of Ambient Air Quality Monitoring in Western Australia* (Technical Series 111 – January 2002).

Department of Health (2006). *Health Risk Assessment in Western Australia*.

DEC 2004, *Guidance for groundwater management in urban areas on acid sulfate soils (2004)*, Department of Environment and Conservation, 168 St Georges Terrace, Perth WA 6000

DEC 2010a, *Classification under the Contaminated Sites Act 2003 – Action Required, Lot 20 Adelaide St, Hazelmere*, Department of Environment and Conservation, Contaminated Sites Branch, 168 St Georges Terrace, Perth WA 6000.

DEC 2010b, *Notice of classification of a known or suspected contaminated site under section 15 of the Contaminated Sites Act (2003)*, Department of Environment and Conservation, Contaminated Sites Branch, 168 St Georges Terrace, Perth WA 6000.

Department of Health (DoH), 2009 (updated 2012) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009)*, Toxicology Branch, Environmental Health Directorate, Department of Health, PERTH BUSINESS CENTRE WA 6849

DoW (2009) Operational policy 5.12: *Hydrogeological reporting associated with a groundwater well licence*, Western Australian Department of Environment

DoW (2009) *Strategic policy 5.03 – Metering the taking of water*, Western Australian Department of Environment

DoH (2006) *Contaminated Sites Reporting Guideline for Chemicals in Groundwater*

Environmental Protection Authority (EPA) 2004, *Guidance Statement No. 3 - Guidance for the assessment of environmental factors (in accordance with the Environmental Protection Act 1986): Separation distances between industrial and sensitive uses*, Environmental Protection Authority, 168 St Georges Terrace, Perth WA 6000.

Environmental Protection Act 1986

FOI 1233/05 by Department of Environment & Conservation (DEC) – Freedom of Information – Lot 20, Adelaide Street, Hazelmere (October 2005).

Government of Western Australia (2000). *Bush Forever Volume 2: Directory of Bush Forever Sites*, Department of Environmental Protection, accessed 20th September 2012.

Greg Rowe & Associates 2012, *Community Management Strategy for Remediation of Site: Lot 20 Adelaide St, Hazelmere*, Greg Rowe & Associates, Northbridge WA 6003.

Herring Storer 2012, *Acoustic Assessment: Lot 20 Adelaide St, Hazelmere*, Herring Storer Acoustics, Como WA 6152.

MDW Environmental Services (MDW) 2012a, *Groundwater Investigation Report Lot 20 Adelaide Street, Hazelmere*, Prepared for Wasterock Pty Ltd, Mobile Dewatering Environmental Services Unit Trust U1/22 Elmsfield Road, Midvale, Western Australia 6056

MDW 2012b, *Operating Strategy: Lot 20 Adelaide Street, Hazelmere*, Prepared for Wasterock Pty Ltd, Mobile Dewatering Environmental Services Unit Trust U1/22 Elmsfield Road, Midvale, Western Australia 6056

MDW 2012c, *Air Quality Management Plan: Lot 20 Adelaide Street, Hazelmere*, Prepared for Wasterock Pty Ltd, Mobile Dewatering Environmental Services Unit Trust U1/22 Elmsfield Road, Midvale, Western Australia 6056

MDWES 2012e – Groundwater Abstraction Plan for Dust Suppression & Surface Compaction (GWAMP) v2 – Adelaide Street Hazelmere (October 2012).

MDW 2012d, *Soil Amendment Management Plan: Lot 20 Adelaide Street, Hazelmere*, Prepared for Wasterock Pty Ltd, Mobile Dewatering Environmental Services Unit Trust U1/22 Elmsfield Road, Midvale, Western Australia 6056

National Occupational Health and Safety Commission (1995) *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003(1995)]. Government of Australia: Canberra, ACT.

National Occupational Health and Safety Commission (2005) *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition* [NOHSC:3003(2005)]. Government of Australia: Canberra, ACT.

National Environmental Protection Council (1998). *National Environmental Protection Measure for Ambient Air Quality*. Government of Australia: Canberra, ACT.

NIOSH (2003) *NIOSH Manual of Analytical Methods (NMAM), Fourth Edition - NIOSH Method 7500 - Silica, Crystalline, by XRD*.

NTEC Environmental Technology (2012) *Groundwater modelling for the Wasterock Hazelland Landfill site in Hazelmere, Western Australia*.

National Environmental Protection Council (2003) *National environment protection (ambient air quality) measure – as amended*. Government of Australia: Canberra, ACT.

Parsons Brinckerhoff Australia Pty Ltd, 2006, *Site Investigation, Former Adelaide Street Landfill Lot 20 Adelaide St, Hazelmere, Western Australia*, unpublished report prepared for Happy Valley Landfill Pty Ltd by Parsons Brinckerhoff, 1 Alvan Street Subiaco WA 6008.

Safework Australia 2005, *Code of practice for the management and control of asbestos in the workplace (2005)*, Commonwealth of Australia, National occupational health and safety commission, available at <http://www.safeworkaustralia.gov.au/> accessed [8/8/2012]

Standards Australia (2003). Australian/New Zealand AS/NZS 3580.9.6:2003 *Methods for sampling and analysis of Ambient Air – Method 9.3: Determination of Suspended Particulate Matter - PM10 – High Volume Sampler Gravimetric Method*. SAI Global.

Standards Australia (2007). Australian/New Zealand Standards AS 3580.1.1:2007 – *Methods for Sampling and Analysis of Ambient - Air-Guide for Siting Air monitoring Equipment*. SAI Global.

Standards Australia (2008). Australian/New Zealand Standards AS 3580.9.11:2008 – *Methods for Sampling and Analysis of Ambient – Determination of Suspended Particulate Matter – PM10 Beta Attenuation Monitors*. SAI Global.

Standards Australia (2011). Australian/New Zealand Standards AS 3580.14-2011 – *Methods for Sampling and Analysis of Ambient – Meteorological Monitoring for Ambient Air Quality Monitoring Applications*. SAI Global.

The National Greenhouse Accounts (NGA) Factors (July 2013) has been prepared by the Commonwealth Department of Climate Change and Energy Efficiency and is designed for use by companies and individuals to estimate greenhouse gas emissions.

Waste Authority 2012, *Western Australian Waste Strategy: "Creating the Right Environment"*, Office of the Waste Authority, Government of Western Australia, Perth.

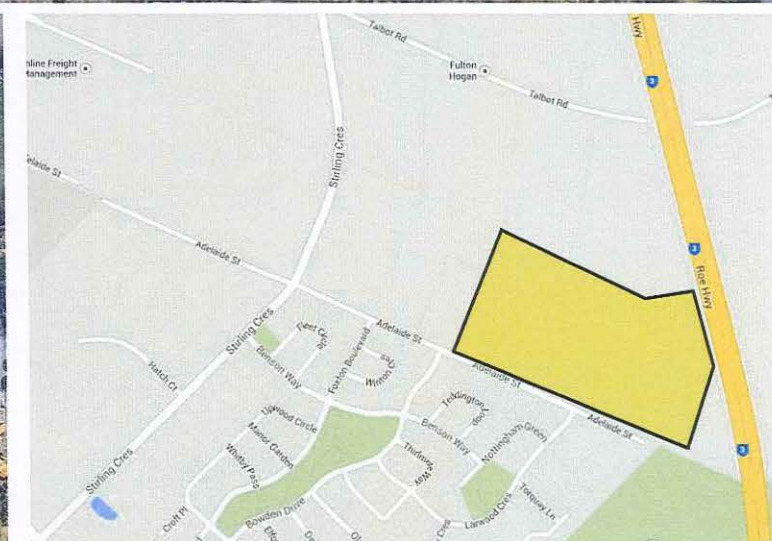
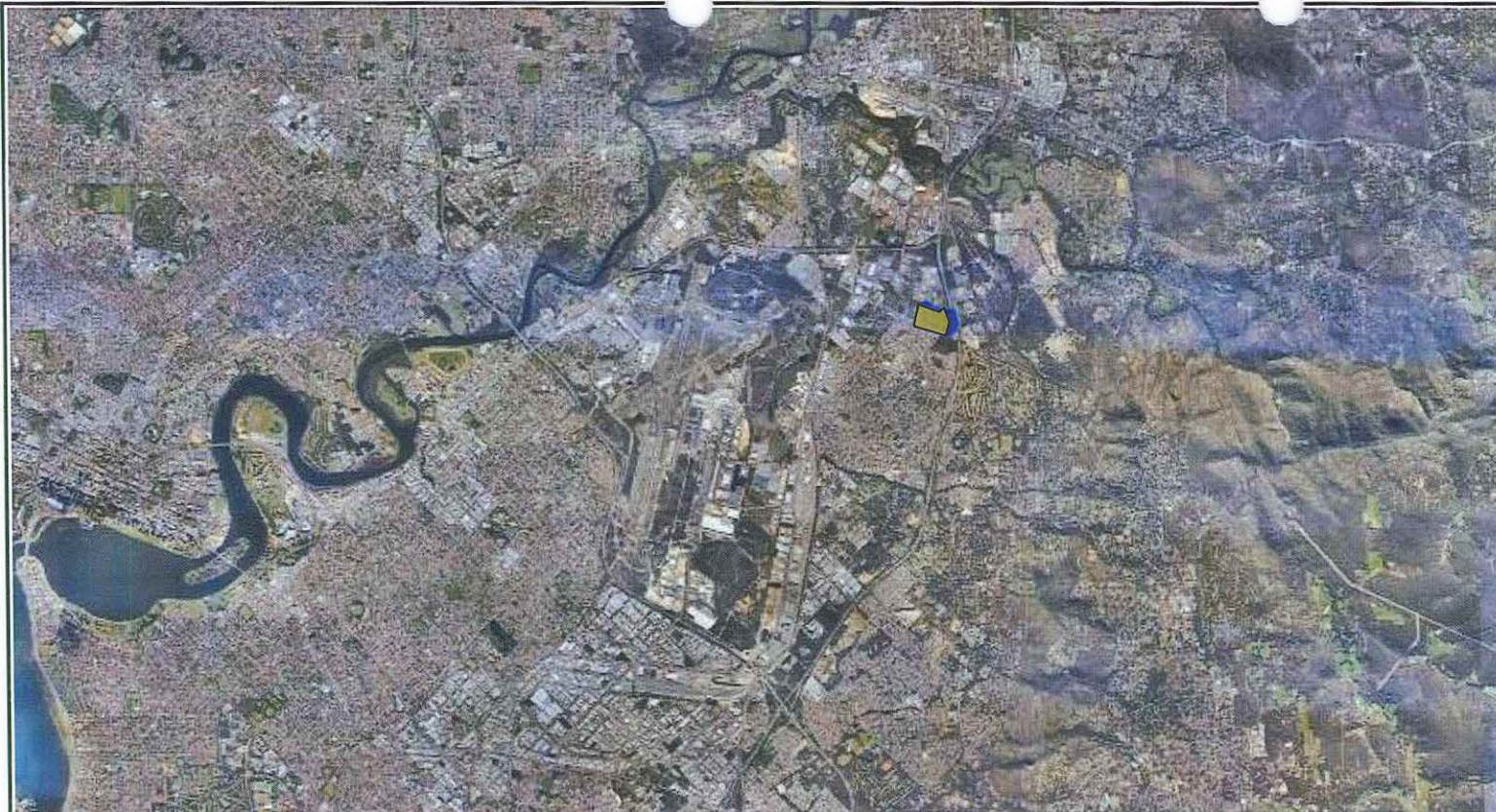
Western Australian Planning Commission (WAPC) 2012, *Metropolitan Region Scheme*, Department of Planning, Gove.




Water Corp. (2007) *Industrial Waste Information Brochure – Acceptance Criteria for Industrial Waste – PUB 06*. Water Corporation.

Waste Rock Pty Ltd – Site Remediation Works Agreement and Site Management Plan (SMP) (Final) – Lot 20 Adelaide Street. (March 2014).





USEPA (2013) *US EPA Code of Federal regulations – Protection of Environment 40 CFR part 53 Subpart D*. United States of America.

Appendix A – Figures and Supporting Documents



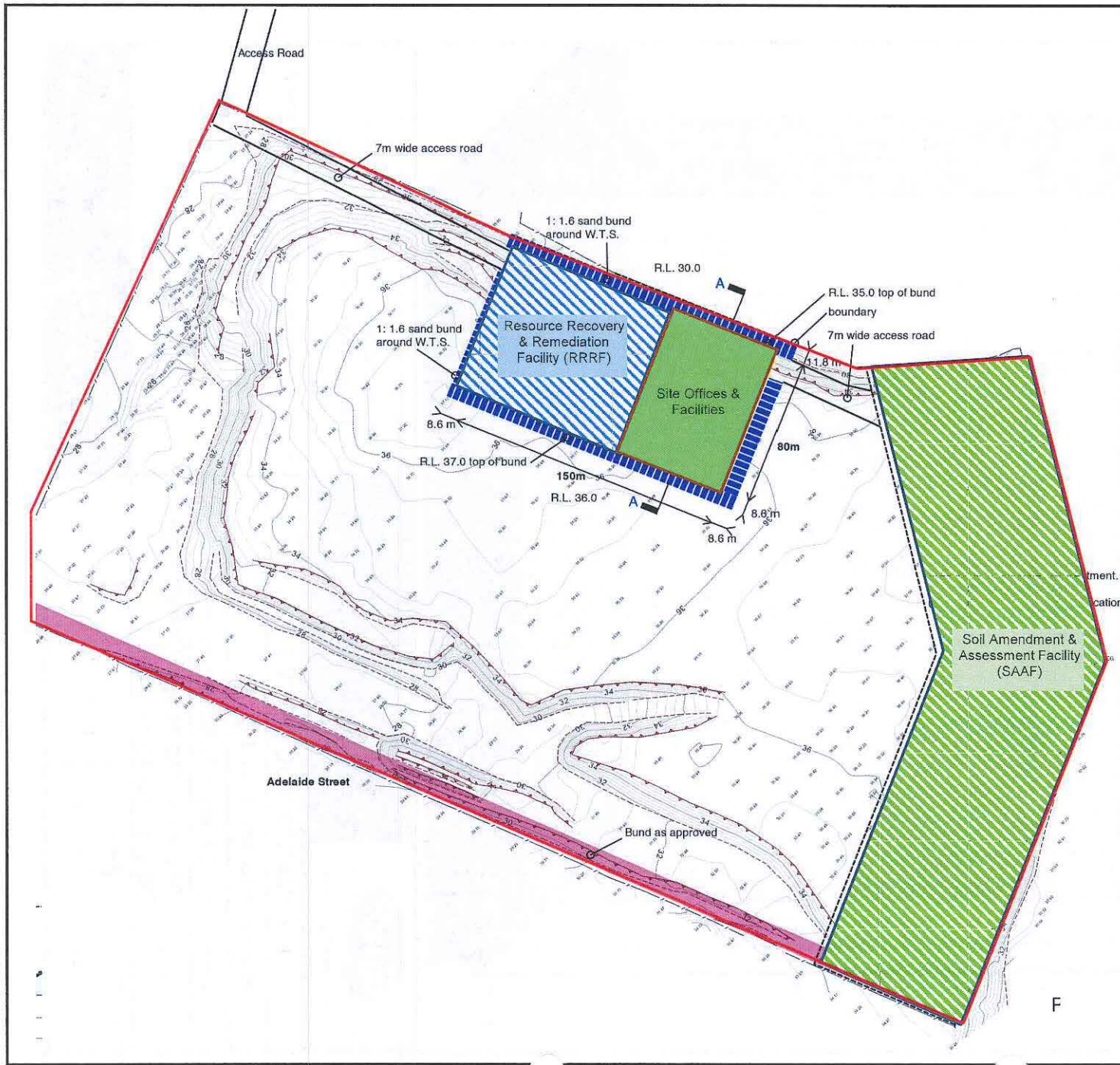
MDW Environmental Services PERTH PEEL  T: (08) 9250 6960 F: (08) 9250 8269 www.environmentalservices.com.au info@environmentalservices.com.au	
Client:	
WASTEROCK PTY LTD	
Project:	
Hazelmere Landfill	
Location:	
Lot 20 Adelaide Street, Hazelmere	
Drawing Title:	
SITE AND REGIONAL VIEW	
Notes:	
 Site Location	
Drawn by: Dale A.	Scale: Scale Not Used
Date: 10/09/2013	
Project No: E2012 - 031	Figure No: 1
	Rev: v1








MDW Environmental Services PERTH PEEL  T: (08) 9250 6960 F: (08) 9250 8269 www.environmentalservices.com.au info@environmentalservices.com.au		
Client:		
WASTEROCK PTY LTD		
Project:		
Hazelmere Landfill		
Location:		
Lot 20 Adelaide Street, Hazelmere		
Drawing Title:		
PROPOSED ACCESS ROAD		
Notes:		
 Site Location  Proposed Site Access		
Drawn by: MB	Scale: Scale Not Used	 North
Date: 7/01/2014		
Project No:	Figure No:	Rev:
E2012 - 031	2	v1



REDACTED



MDW Environmental Services PERTH PEEL  T: (08) 9250 6960 F: (08) 92508269 www.environmentalservices.com.au info@environmentalservices.com.au		
Client:		
WASTEROCK PTY LTD		
Project:		
Hazelmere Remediation and Regeneration Project		
Lot 20 Adelaide Sreet		
Drawing Title:		
Survey of Site		
Notes:		
Location of :		
	Resource Recovery & Remediation Facility	
	Soil Amendment & Assessment Facility	
	Site Boundary	
Drawn by:	Scale:	 North
MB	0 100 m	
Date:	7/01/2014	
Project No:	Figure No:	Rev:
E2012 - 031	4	v1



MDW Environmental Services

PERTH | PEEL



T: (08) 9250 6960

F: (08) 92508269

www.environmentalservices.com.au

info@environmentalservices.com.au

ENVIRONMENTAL SERVICES

Client:

WASTEROCK PTY LTD

Project:

Hazelmere Remediation and Regeneration Project

Location:

Lot 20 Adelaide Street, Hazelmere

Drawing Title:

Proposed Location of Groundwater Bores for Abstraction for Dust Suppression

Notes:



Proposed Location of Abstraction Bores and holding tanks (50,000L x2) for groundwater's to be used as dust suppression

Drawn by:

Dale A

Date:

10/09/2013

Project No:

E2012 - 031

Scale:



Figure No:

5

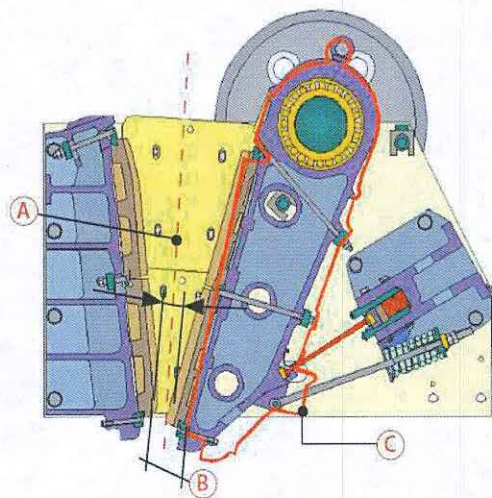


North

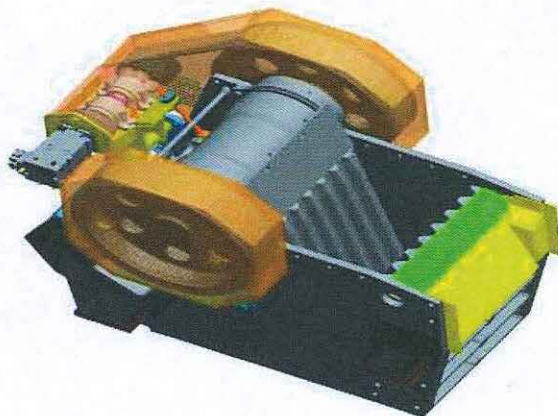
Rev:

v1

Jaw Crusher cross section showing closed and open side setting and at rest

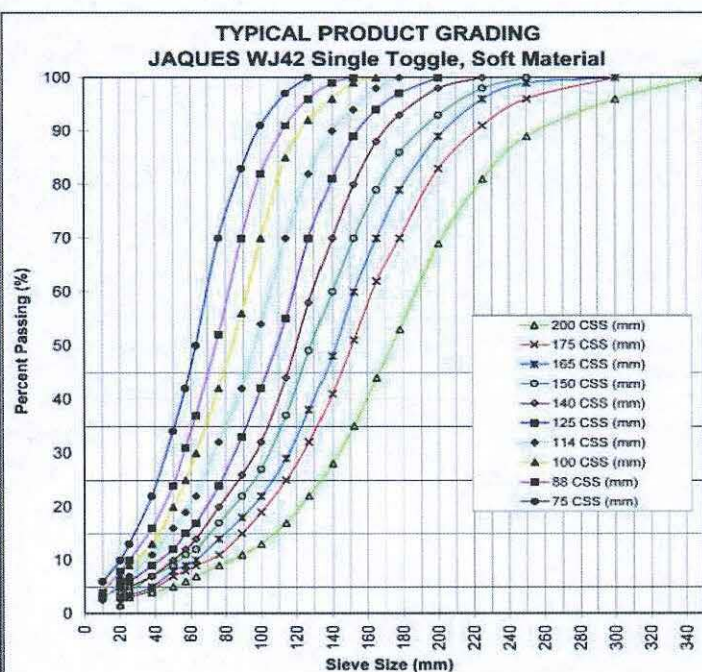


Width of CSS determines size of product, characteristics of material determine size range of product



CSS (A), OSS (B) and stopped (C)

Sieve Size (mm)	200 CSS (mm)	175 CSS (mm)	165 CSS (mm)	150 CSS (mm)	140 CSS (mm)	125 CSS (mm)	114 CSS (mm)	100 CSS (mm)	88 CSS (mm)	75 CSS (mm)
400										
350	100									
300	96	100	100							
250	89	96	99	100						
225	81	91	96	98	100					
200	69	83	89	93	98	100				
178	53	70	79	86	93	97	100			
165	44	62	70	79	88	94	98	100		
152	35	51	60	70	80	89	94	99	100	
140	28	41	48	60	70	81	90	96	99	
127	22	32	38	49	58	70	82	92	96	100
114	17	25	29	37	44	55	70	85	91	97
100	13	19	22	27	32	42	54	70	82	91
89	11	15	18	22	26	33	42	56	70	83
76	9	11	14	17	20	24	32	42	52	70
63	7	9	10	12	14	17	22	30	37	50
57	6	8	9	11	12	15	19	25	31	42
50	5	7	8	9	10	12	16	20	24	34
38	4	5	5	7	7	9	11	13	16	22
25	3	3	4	4	5	6	7	9	10	13
20	2	2	3	3	4	5	6	7	8	10
10						3	3	4	4	6



MDW Environmental Services

PERTH | PEEL



T: (08) 9250 6960

F: (08) 92508269

www.environmentalservices.com.au

info@environmentalservices.com.au

Client:

WASTEROCK

Project:

Wasterock

Location:

Lot 20 Adelaide Street, Hazelmere

Drawing Title:

JAW CRUSHER

Notes:

Capacities may vary depending on type of material, gradation of material, feed method, moisture, bulk density, clay content and fracture characteristics for the material

Drawn by: KW

Date: 17/01/2014

Project No:

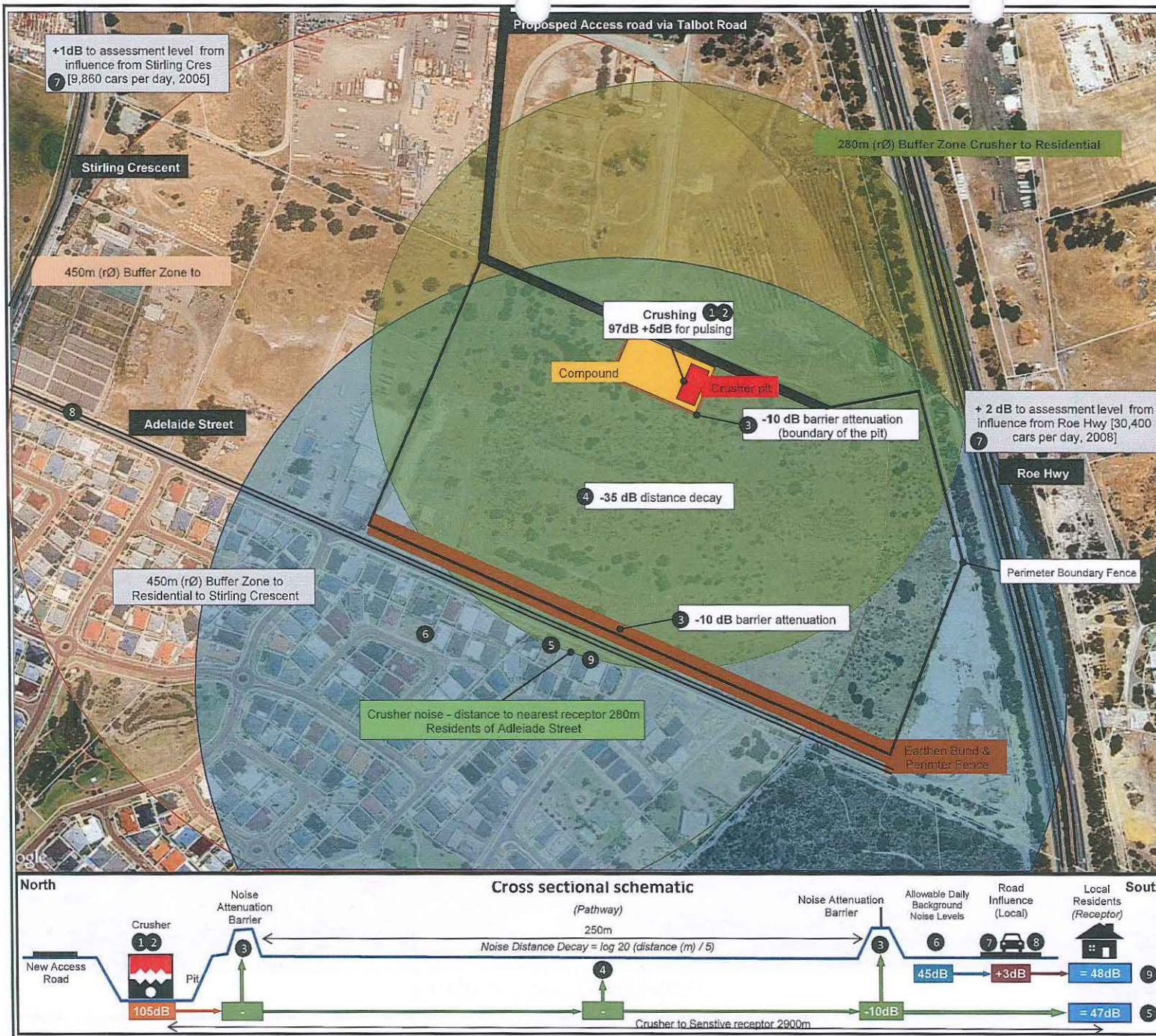
Figure No:

Rev:

E2012-031

6

v1



Client:

WASTEROCK PTY LTD

Project:

Lot 20 Adelaide Street

Location:

Lot 20 Adelaide Street, Hazelmere, Perth

Drawing Title:

NOISE ASSESSMENT - Crusher

Notes:

Noise From source to Receptor Calculation

- Noise at nearest receptor equal to noise measured 5 metres from source (97 dB)
- plus impulsiveness (+5 dB), modulation and tonality
Impulsiveness from crunching of material as it is crushed.
- Less barrier attenuation x2 (Total -20 dB)
- less distance decay (-35 dB) as per BS5228-1
- Equivalent measured noise at receptor
47 dB L_{A10}

Allowable Assessment Criteria at Receptor Calculation

- Assessment criteria for nearest houses
7 am to 7 pm Monday to Saturday
Allowable noise level as per regulations (45 dB)
- plus influencing factor from roads
add 2 dB due to proximity to Roe Hwy
add 1 dB due to proximity to Stirling Cres
- No allowance made for noise from the trucks using Adelaide St could add an additional 5dB (not included)
- Calculated Assessment level 48 dB L_{A10}

Drawn by:

KW

Date:

17/01/2014

Project No:

E2012 031

Scale:

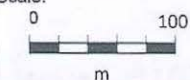


Figure No:

7



North

Rev:

v1

Process flow description



Vibrating feeder sorts and passes fine and coarse material to screen deck

Clean **oversize** material passes over top screen to end conveyor

Mid-size material passing through top deck but too large to pass through bottom screen passes to rear off-set conveyor



Fine material passing through bottom screen is conveyed forward to front off-set conveyor



MDW Environmental Services

PERTH | PEEL



T: (08) 9250 6960

F: (08) 92508269

www.environmentalservices.com.au

info@environmentalservices.com.au

Client:

WASTEROCK PTY LTD

Project:

Hazelmere Landfill

Location:

Lot 20 Adelaide Street

Drawing Title:

SCREENING PLANT

Notes:

Vibrating feeder overlays coarse material over fines as it passes to screen deck.

Size of product determined by size of top and bottom screens.

Drawn by: KW

Date: 17/01/2014

Project No:

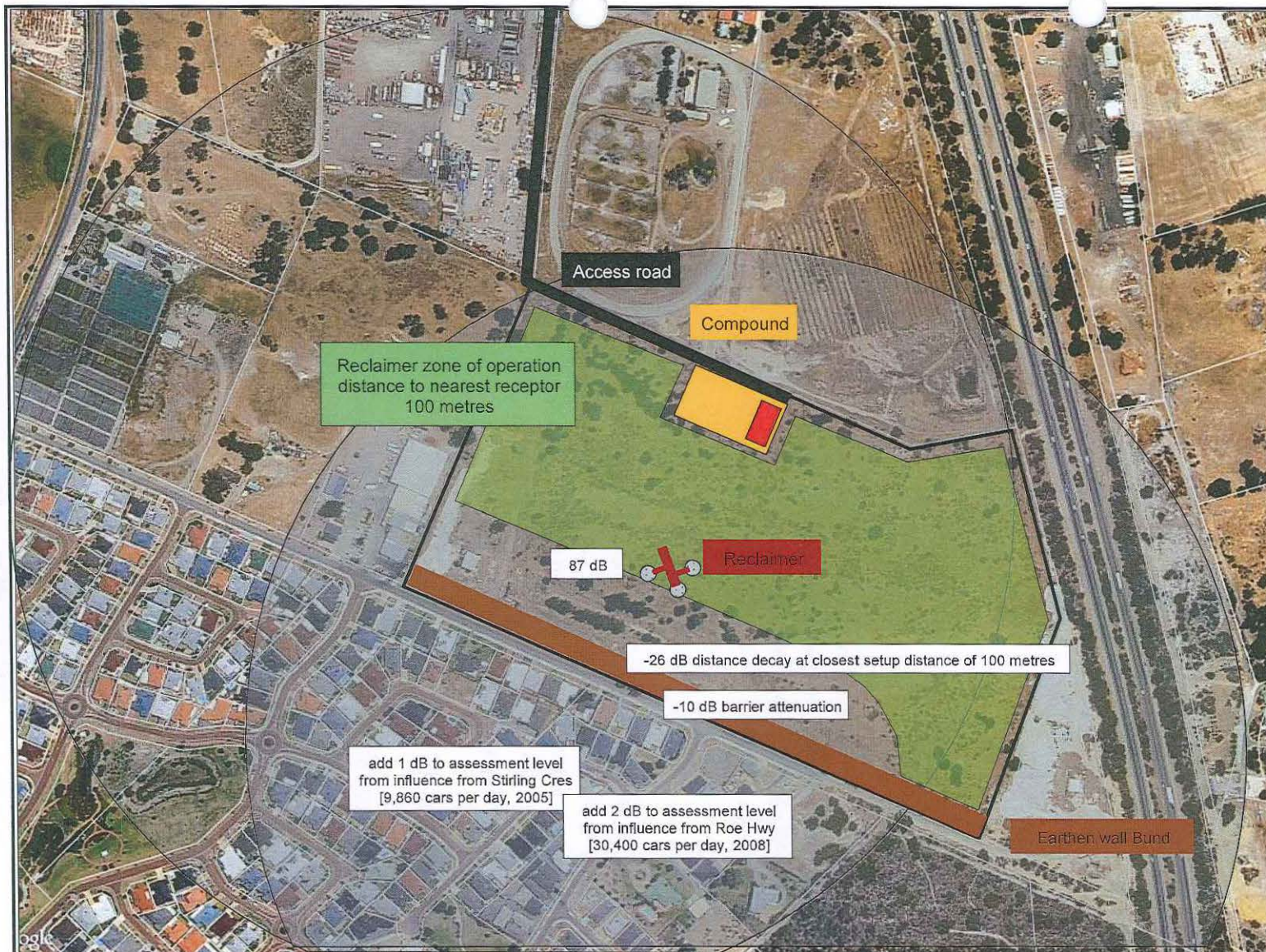
Figure No:

Rev:

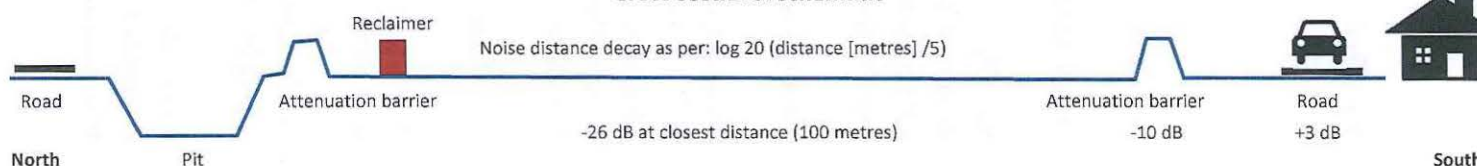
E2012-031

8

v1



Cross sectional schematic



MDW Environmental Services

PERTH | PEEL



T: (08) 9250 6960

F: (08) 92508269

www.environmentalservices.com.au

info@environmentalservices.com.au

Client:

WASTEROCK PTY LTD

Project:

Lot 20 Adelaide Street

Location:

Lot 20 Adelaide Street, Hazelmere, Perth

Drawing Title:

**NOISE ASSESSMENT -
Reclaimer**

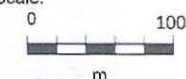
Notes:

- ① Noise at nearest receptor equal to noise measured 5 metres from source (**87 dB**)
- ② plus impulsiveness, modulation and tonality (**nil**)
- ③ Less barrier attenuation (**-10 dB**) and
- ④ distance decay (**-26 dB**) as per BS5228-1
- ⑤ Equivalent measured noise at receptor **47 dB L_{A10}**
- ⑥ Assessment criteria for nearest houses 7 am to 7 pm Monday to Saturday Assigned level as per regulations (**45 dB**)
- ⑦ plus influencing factor from roads add **2 dB** due to proximity to Roe Hwy add **1 dB** due to proximity to Stirling Cres
- ⑧ No allowance made for noise from trucks currently using Adelaide St
- ⑨ Calculated Assessment level **48 dB L_{A10}**

Drawn by:

KW

Scale:



Date:

17/01/2014

Project No:

Figure No:

North

E2012 031

9

v1

Jane Moltoni
Project Manager
Wasterock Pty Ltd
Level 1/32 Ledger Road
BALCATTA WA 6021

Level 19 Alluvion
58 Mounts Bay Road
Perth
WA 6000
Australia

Via email: jmoltoni@moltoni.com.au
And by Post

T: +61 (0)8 9422 4700
F: +61 (0)8 9422 4777

hfw.com

Your Ref:
Our Ref: 072556/01

Direct Line: +61 (0)8 9422 4700
Email: Andre.Maynard@hfw.com
Robert.Desmond@hfw.com

Date: 9 September 2013

Dear Jane,

Lot 20 Adelaide Street, Hazelmere

We refer to your instructions to draft a submission for Wasterock Pty Ltd to provide to the Western Australian Department of Environmental Regulation with details why the proposed remediation works to be undertaken at Lot 20 Adelaide Street, Hazelmere by Wasterock should not require a works approval licence under category 63 of Schedule 1 *Environmental Protection Regulations 1987* (WA).

Submission

Wasterock Pty Ltd (**Wasterock**) will be applying for a licence(s) under Part V *Environmental Protection Act 1987* (WA) (**EP Act**) for works to be undertaken at Lot 20 Adelaide Street, Hazelmere (**Site**). This submission describes the activities that will be undertaken at the Site and then provides recommendations as to how these activities would be most appropriately licensed under the *Environmental Protection Regulations 1987* (WA) (**Regulations**).

Remediation of a contaminated site

Originally used for rural purposes, the Site was used for sand mining between 1978 and 1982 and operated as an inert landfill facility, licensed by the Department of Environmental Regulation (**DER**), from 1987 to 1997. The Site is classified as 'contaminated – remediation required' pursuant to section 13 of the *Contaminated Sites Act 2003* (WA) (**CS Act**). Under the CS Act the owner of the Site has a statutory responsibility to remediate the Site.

Wasterock has been contracted to undertake remediation works on the Site and has prepared a draft Remediation Management Plan describing how the remediation works will be implemented. A copy of the draft Remediation Management Plan is included within the document entitled "Remediation of Landfill Site

Lawyers for international commerce

Hazlemere – 7229 Development Application Report" dated 30 May 2013 which was previously sent to the DER. An independent Contaminated Sites Auditor has been engaged by Wasterock to monitor the remediation works and report to the DER in accordance with the CS Act.

The works that need to be undertaken on the Site are a civil engineering operation which is being undertaken for the specific purpose of remediating the Site and preparing it for future development. These works are unrelated to the operation of a landfill site and/or a waste disposal operation.

Remediation process

Remediation of the Site will involve excavation of the entire site and sorting of existing landfill into various grades of size and quality for reuse or disposal. Processing of some imported construction and demolition (C&D) waste for reuse as clean sand, roadbase and inert engineered fill will also occur. The sand "capping" layer will be sourced from clean fill created from a soil amendment process and clean imported C&D waste. During the excavation process, the Site will receive and process select C&D waste collected from specific locations within the wider metropolitan area for the purpose of sand recovery and creating an upper layer of inert fill.

The C&D waste will be stockpiled and sorted on-site and non-conforming materials will be segregated and dispatched to a licensed landfill facility. Once stockpiled and sorted the inert materials will be crushed and screened to the required size. This process of stockpiling, sorting, crushing and screening is crucial to achieving the successful remediation of the Site, allowing deep placement of asbestos impacted waste, and achieving an optimum grade of compacted materials across the Site to reduce the risks of differential settlement.

The final step in the remediation process is the establishment of a capping layer of clean fill over the Site. This will be achieved by receiving and processing acid sulphate soils (ASS) and hydrocarbon impacted soils (HIS) collected from specific sites within the wider metropolitan area, as well as natural yellow sands when available and a large volume of recovered sands from incoming C&D wastes. ASS and HIS will be treated to neutralise the active elements in the soil. When available, natural yellow sand will be mixed with the treated soils. Once the ASS and HIS has been treated it will be placed in the ground to create the final capping layer over the Site. The process is a well established practice for remediating a contaminated site. Any excavated contaminated soil that cannot be reused on Site will be scheduled for disposal at a designated landfill site.

An application for a licence under Part V EP Act will therefore be made to the DER for the purpose of obtaining approval to operate as a remediation and resource recovery facility and a soil acceptance and amendment facility for the duration of the remediation. Crushing and screening licenses will form part of the licensing requirement.

Note: No materials from the existing landfill will be crushed prior to sorting. Only oversize concrete retrieved from the Site will be considered for crushing and reuse.

Activities to be undertaken on Site that require a Part V EP Act licence

We understand that the activities that are part of the Remediation Management Plan for the Site that require licensing as a prescribed premises under the EP Act are:

- screening, sorting, crushing and separation of fill on the Site;
- crushing of C&D waste;
- receiving C&D waste on Site for sorting, processing and re-use; and
- soil amendment of ASS and HIS.

We understand that the screening and crushing activities would be most appropriately licensed under prescribed premises categories 12 and 13 respectively. The activity of receiving waste onto the Site for sorting, storage and reuse would be most appropriately licensed under prescribed premises category 62. The category 62 licence applies to "*premises on which waste is stored, or sorted pending final disposal or re-use.*" The term 'reuse' is not defined in the Act, the Regulations. Under *the Landfill Waste Classifications and Waste Definitions 1996 (As Amended) (Definitions)* reuse is defined as '*use of a product again for the same or different purpose without further manufacture.*'

Wasterock receive C&D waste onto the Site at the designated transfer station cell so as to extract reusable materials such as sand and crushed concrete. The C&D waste is received onto the Site from specific locations and the general public do not have the right to dispose of C&D waste at the Site. The waste is sorted with usable materials either being reused on Site a part of the earthworks or sent offsite as processed materials. Unusable materials are sent offsite to a licensed landfill for final disposal.

The works occurring at the Site amount to the sorting of and processing of C&D waste to create a product known as engineered fill which is then placed, following recognised earthworks standards of practice, to establish geotechnically stable foundations for the future development of the Site. This activity is clearly what is known as a transfer station operation (or resource recovery facility) and is most appropriately licensed as prescribed premises under category 62 of the Regulations.

Reuse is identified in the objects of the *Waste Avoidance and Resource Recovery Levy Regulations 2008 (WA) (Levy Regulations)* as a form of resource recovery, an efficient use of resources and a higher 'resource management option' than disposal. The Levy Regulations, like the Regulations make a clear distinction between the final disposal of waste and the reuse of waste.

Category 63 Licence – licensed Class I landfill

The activities of receiving, processing and reusing waste on the Site do not fit under prescribed premises category 63 of the Regulations. Category 63 of the Regulations describes the category as:

"Class I inert landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer and as amended from time to time) is accepted for burial."

According to Supreme Court Justice Corboy the expression "*premises on which waste is accepted for burial*" within category 63 of the Regulations was intended to refer to premises on which waste satisfying the criteria for each of the classes of landfill referred to in those categories was accepted for disposal by burial as

landfill.¹ The Definitions define "landfill" to mean "*a site used for disposal of solid material (ie, is spadeable) by burial in the ground that is licensed as landfill under [the EP Act].*"

The term burial is not defined in the Act, the Regulations or the Definitions. The ordinary meaning of 'burial' is '*the action of burying something*' and 'bury' means '*to put under the ground in sign of final abandonment or abrogation; dispose of thus.*'² The term 'disposal' is not defined in the EP Act, the Regulations or the Definitions. The ordinary meaning of 'disposal' is '*the action of disposing of or getting rid of*' and dispose means to '*get rid of; deal conclusively with.*'³

It is clear then that under the Regulations a category 63 licence applies to a site that is used for the conclusive act of getting rid of solid material by putting it under the ground and this act amounts to the final abandonment of the waste material.

A landfill has a clear role as a disposal facility for waste. The Site, on the other hand, is receiving waste for processing and subsequent reuse as engineered fill, which fulfils two principal roles:

- 1) the product is used as a critical part of the remediation of the Site as it was classified *contaminated – remediation required* under the CS Act; and
- 2) the product is part of the geotechnical process of preparing a stable foundation for the future development of the Site.

The activities of processing and reuse of waste materials on the Site and the taking of unusable materials to a licensed landfill do not amount to the final disposal of waste through burial on the Site and therefore do not fit within the description of category 63 prescribed premises.

Category 61A – Solid Waste Facility

Whilst Wasterock firmly believes that the activities it will undertake on the Site are best regulated under category 62 it is worth noting that the activities on the Site are still better suited to classification under category 61A than 63. Category 61A is described as follows:

"Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated or discharged onto land."

Under the reasoning given for classifying the Dalyellup Waste Residue Disposal Facility (**Dalyellup Facility**) as a category 61A solid waste facility it was stated by the DER that "*This site is not considered to be classified as a "landfill" because other waste material and the public do not have access to the DWRF facility. The material disposed has been assessed against landfill classification as the most suitable relevant guidelines.*"⁴

¹ *Eclipse Resources Pty Ltd v McNamara, Chief Executive Officer, Dept of Environment and Conservation (No 2)* [2012] WASC 264 at [125]

² Stevenson, A., New Shorter Oxford Dictionary, 2007, Oxford University Press

³ Stevenson, A., New Shorter Oxford Dictionary, 2007, Oxford University Press

⁴ Licence L6130/1989/12, Millenium Inorganic Chemicals Ltd, 21/01/2010 - <http://www.dec.wa.gov.au/pdf/licensingregs/K-Z/K-O-number/1208.pdf>

Page No. 5

Both the Site and the Dalyellup Facility do not grant access to the public to dispose of waste. The Dalyellup Facility accepts solid waste from the Kemerton and Australind processing plants. In a similar way the Site will only accept C&D waste, ASS and HIS from a limited number of sources.

At the Dayellup Facility the solid waste is reprocessed and treated by re-wetting the waste into a slurry and then placed into position using a simple gravity feed system on site. In comparison the Site receives C&D waste, ASS and HIL. The wastes are sorted and then treated using established remediation and earthworks practices to ensure that the materials conform to the correct engineering specifications (and DER guidelines). The engineered fill and clean fill materials created as a result of the on-Site processing are then reused as a foundation material for the future development of the Site. The Site's activities do, therefore, involve the storing, reprocessing and treatment of solid waste that is produced on other premises. However, due to the fact that waste will be again sent offsite for disposal at a licensed landfill category 62 most appropriate.

We look forward to hearing from DER regarding its view on the correct classification of the Site and we are happy to meet with DER to discuss this submission.

Yours sincerely



Holman Fenwick Willan