16 July 2015 Document No. 147645033-026-L-Rev0

Rebecca Kelly
Manager Licensing, Waste Industries
Department of Environment Regulation
Licensing and Approvals
Locked Bag 33
Cloisters Square
PERTH WA 6850

**ALLAWUNA FARM WORKS APPROVAL APPLICATION: W5830/2015/1**
**FURTHER INFORMATION**

Dear Rebecca

The Department of Environment Regulation (DER) submitted a letter to SITA Australia Pty Ltd (SITA) dated 17 June 2015 requesting further information in regards to the Works Approval Application for the Allawuna Farm landfill. Golder Associates Pty Ltd (Golder) is pleased to provide the following response on behalf of SITA.

The queries have been addressed in the same order as your enquiry.

## 1.0 GENERAL

- *It is noted that all of the prescribed activities are occurring within Lot 4869. Please confirm that the premises boundary is requested for all four lots (Lot 4869 on Plan 224502, Lot 5931 on Plan 117294, Lot 9926 on Plan 126311 and Lot 26934 on Plan 158673).*

The premises boundary is requested for Lot 4869 on Plan 224502 only.

- *Vermin management plan.*

Refer Attachment A for the Vermin Management Plan.

## 2.0 WINDBLOWN WASTE

- *Number and location of litter screen and details on their construction material and dimensions.*

Allawuna Farm will utilise a combination of mobile and immobile litter fences or screens in conjunction with daily litter inspections and covering of the waste to manage windblown waste. Permanent fences will be constructed at the perimeter of the property and will consist of steel frames with chain-wire mesh panels. Portable litter fences will be used around the working face (Refer Appendix C in Attachment B for placement details). The number of screens will be adapted to suit the working face configuration, but is expected to be between 7 and 10 screens at any time. The screens will be constructed utilising steel frames and chain-wire mesh and be at least 1.8 m high. Please refer Attachment B for further details on the Litter Management Plan.

## 3.0 WASTE ACCEPTANCE

- *Asbestos Management Plan in accordance with the "Guidelines for managing asbestos at construction and demolition waste recycling facilities", published by the Department of Environment and Conservation, December 2012.*


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Refer Attachment C1 for the management of asbestos waste at Allawuna Farm, including:

C1.1 (Work Instruction, Asbestos Waste Management)

C1.2 (Work Instruction, Asbestos Waste Identification, Isolation and Containment), and

C1.3 (Standard Operating Procedure, Asbestos Waste).

- *Waste acceptance management plan including:*
  - *Details on how and where waste is stored and sorted prior to being filled including any infrastructure required for these activities*
  - *Details on how long waste will remain on site before being sorted or filled*
  - *Details on how non-conforming waste will be sorted, how/where it will be stored, and how long it will remain on site.*

Waste will generally be received and pre-sorted at the SITA Welshpool and Landsdale transfer stations and transported to the landfill via road trains. Hence only pre-sorted waste will be received and landfilled at the site and no sorting will take place at the landfill. However, should any non-conforming waste be identified at the working face, this waste will be removed from the working face and isolated on the landfill, from where it will be removed to a suitably licensed disposal facility. For further details refer to the Waste Acceptance Manual in Attachment C2.

## 4.0 SURFACE WATER

- *Confirmation that the permit required under the Rights in Water and Irrigation Act 1914 to construct the creek crossing has been obtained, and details of this permit.*

Refer Attachment D1 for email correspondence related to the approvals for the creek crossing. We have been advised by Brendan Imms from the Department of Water (DoW) that the

> "DoW's position is still that the application for the bed and banks permit will not be assessed until full approval for the development has been reached. Once the DER's concerns have been resolved, we will be in a position to assess your application regarding the 13 Mile Brook crossing. We believe it is appropriate and prudent to take a holistic approach to the assessment of any development at the site. As such, we cannot issue the bed and banks permit until the DER is satisfied with the proposal and the development is clear to proceed."

SITA will accordingly apply for the permit required under the Rights in Water and Irrigation Act 1914 to construct the creek crossing after the planning approval and works approval are granted (if that occurs). SITA will comply with its obligations under that Act and will not construct the creek crossing until the necessary approvals are obtained.

Refer Attachment D1, where Brendan Imms from the DoW advised that:

> "I have looked over the information provided with the Form 3P you have sent in and at this stage can see no reason that would prevent the issuing of a permit for the crossing, should the landfill proposal go ahead."

- *Confirmation of approval from Department of Water to construct the dam and take water*

Refer Attachment D2 for email correspondence with the Department of Water in regards the requirement of licences for the construction of or use of water from the stormwater dam. We have been advised by Matthew Viskovich from DoW that a licence is not required for the construction of the dam or for taking water from the dam as the dam is not located across a proclaimed watercourse.

## 5.0 NATIVE VEGETATION

- *Confirmation that SITA Australia Pty Ltd is the landowner of all the lots which contain vegetation proposed to be cleared.*

SITA Australia Pty Ltd will become the landowner of all lots 5931, 9926, 26934 and 4869 pending obtaining approval for the Works Approval Application and other related approvals. As such SITA will be the landowner of all the lots which contain any vegetation proposed to be cleared.

SITA has applied for a clearing permit for the intersection upgrade work, as advertised in DER's Monday notices on 29 June 2015. The details are: SITA Australia Pty Ltd, Purpose Permit, Lot 29259 on Plan 21496 Inkpen and St Ronans, Great Southern Highway Road reserve (PIN 11408616), Inkpen and Lot 4869 on Deposited Plan 224502, St Ronans, Shire of York, intersection upgrades, 0.7 ha, (CPS 6618/1).

## 6.0 ODOUR EMISSIONS

- *Odour Management Plan including contingency if odour is accumulated in the valley.*

In the unlikely event that odour accumulates in the valley and the regular management measures (Refer Section 3.6 of Attachment E) are unsuccessful in achieving odour dispersal, the areas of fugitive landfill emissions will be identified and remediated via the drilling of additional gas wells, or via the use of a temporary geomembrane cap. Refer Attachment E for further information on the Odour Management Plan.

- *Further information for re-circulation of leachate into the landfill.*

General management practice for leachate will involve evaporation from the leachate dam or trucking off site. Leachate will only be recirculated into the landfill in the case of an emergency. Recirculation will take place at the working face where the leachate will be irrigated onto the working face as recommended in the Vic BPEM[1].

## 7.0 DUST EMISSIONS

- *Prevailing wind direction*

Prevailing wind direction in the morning is predominantly south easterly, while it changes to a westerly direction in the afternoon. (Refer Appendix C and D of Attachment F.)

- *Type of dust monitors proposed and discussion in regards to their siting as recommended under AS 3580.1.1*

Four dust monitors will be located around the site, two towards the eastern boundary of the farm, one directly north of the landfill and one towards the north-western corner of the farm. (Refer Appendix B in Attachment F). The equipment that will be used to monitor the dust will be Met One Instruments' E-Sampler light scatter aerosol monitors, or similar. (Refer section 3.2 in Attachment F.)

- *Monitoring frequency*

Monitoring frequency will vary between daily to quarterly depending on location. The frequency is provided in Table 4, Section 3.4 of Attachment F.

- *Criteria used for comparison of dust results (further clarification received in subsequent email (dated 7/7/2015) required comparison of the dust management plan against dust guidelines published by the then DEC and if dust sampling is undertaken a comparison of these results against relevant criteria such as NEPM to demonstrate whether the dust emissions comply with the criteria)*

Three trigger levels are proposed for commencement of dust management and cessation of dust generation activities. These triggers are:

1) Generation of visible dust

2) Forecast of strong winds (in the range of 26 to 33 knots)

3) Particulate matter measurements as PM10 greater than 50 µg/m3

Further details are provided in Section 3.6 of Attachment F.

1 Environmental Protection Agency (EPA) Victoria, "Siting, design, operation and rehabilitation of landfills," Best Practice Environmental Management (BPEM), October 2014

- *Nature of the contaminated dust and any potential impacts for airborne and deposited dust of this nature*

Under certain circumstances dust may be generated from truck movements, material stockpiles and waste placement. Dust will be suppressed using measures specified in the Dust Management Plan. It is not expected that dust will impact neighbouring properties given the substantial buffers afforded within the Allawuna Farm property. Control measures are further described in Appendix O2 – Allawuna Landfill Operation Health and Safety Risk Assessment contained in the Works Approval Application.

- *Number of trucks entering the site each day*

The estimated number of waste trucks entering the site is 24 per day. Refer Section 1.7 of Attachment F.

For further details on the Dust Management Plan refer to Attachment F.

## 8.0 LANDFILL GAS

- *Values used in modelling for waste degeneration rates*

The values used in the modelling for the waste degeneration rates are included in Attachment G and summarised in section 3.0 of report 147645033-010-L-Rev0 (Appendix G1 of Works Approval Application reference mky1ff)

- *Defining the frequency that the GasSim model be reviewed and updated*

The recommended frequency for revision of the GasSim model is approximately 2 years or after a period of time where sufficient site data has been obtained. In addition revision of the model would also typically be undertaken prior to the commissioning of a landfill gas extraction system, assumed to be some time following the completion of the first cell (approximately 3.5 years). Dependant on the procurement model for gas management at the site, modelling may be undertaken by either SITA or a landfill gas contractor in order to support a business case for investment in a suitable gas management system for the site.

- *Specification on the anticipated optimum level of landfill gas required for a landfill gas engine to be viable.*

A viable gas flow rate for commissioning a landfill gas engine is dependent on a number of factors including engine size and type, methane concentration and quality of the LFG, gas collection efficiency, cell construction methodology (will sacrificial wells be utilised), availability of local infrastructure and the preferred procurement model adopted. Nominally, 600 to 800 $m^3$/hr of LFG (assuming 50% methane content) is required to operate a 1MW engine. It is expected that this would occur sometime between 5 to 10 years from when waste deposition commences and taking into account the aforementioned factors. However the financial viability of one or more engines will have to be assessed in light of the site's location relative to grid infrastructure and the site requirements. It is expected that flaring will be the most appropriate and feasible option for the majority of the site's operational and post-closure period.

## 9.0 NOISE

- *Noise management plan*

Refer Attachment H for the Noise Management Plan.

- *Details on the construction of noise bunds*

Acoustic modelling has shown that noise bunds will not be required. However should it become evident during operation of the site that noise bunds would be required a study will be carried out to determine the optimum location and size of such bunds. (Refer Section 4.2 of Attachment H.)

## 10.0 LANDFILL STABILITY

- *Reassessment of the stratigraphic models for global stability analysis to consider and clearly identify the variable soil and potentially significant rock depths across the proposed landfill footprint area*

- *Re-analysis of critical stability analyses (Figure C1, C2) with reduced effective cohesion to consider the presence of granular soils as encountered within selected test pits*

- *Sensitivity analysis of the strength parameters assigned to waste under maximum credible earthquake conditions*

Refer Attachment J for a technical memorandum on the reassessment of the landfill stability. The reassessment of the landfill stability did not raise any issues of concern.

## 11.0 CLOSING

We trust the information presented addresses the queries raised. Should you have any questions please do not hesitate to contact John Jones (SITA) or the undersigned.

**GOLDER ASSOCIATES PTY LTD**

Liza du Preez
Associate

LdP/AV/hsl

CC: John Jones – SITA Australia Pty Ltd
Nial Stock – SITA Australia Pty Ltd

Attachments: A – Vermin Management Plan
B – Litter Management Plan
C1 – Asbestos Management Plan
C2 – Waste Acceptance Management Plan
D1 – Creek Crossing Correspondence
D2 – Water Dam Correspondence
E – Odour Management Plan
F – Dust Management Plan
G – Landfill Gas Modelling Values
H – Noise Management Plan
J – Landfill Stability

http://aupws.golder.com/sites/147645033alluwunafarmpeerreview/correspondence out/147645033-026 der queries and responses 17 june 2015/147645033-026-l-rev0.docx

## ATTACHMENT A

**Vermin Management Plan**


THE LEADER IN RESOURCE RECOVERY

# ALLAWUNA LANDFILL – VERMIN MANAGEMENT PLAN

This report describes the Vermin Management Plan proposed for the landfill facility at Allawuna Farm in the Shire of York.

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## TABLE OF CONTENTS



## TABLES

## ACRONYMS

| | |
|---|---|
| APVMA | Australian Pesticides and Veterinary Medicines Authority |
| BPEM | Best Practice Environmental Management |
| DPaW | Department of Parks and Wildlife |
| DAFWA | Department of Agriculture and Food Western Australia |
| EPA | Environmental Protection Authority |
| EP Act | Environment Protection Act |
| NEPM | National Environmental Protection Measure |
| MSDS | Material Safety Data Sheet |
| PPE | Personal Protection Equipment |
| WA | Western Australia |

## UNITS OF MEASURE

| | |
|---|---|
| ha | Hectares |
| km | Kilometre |
| m | Metre |
| mm | Millimetre |
| $m^2$ | Square Metre |
| $m^3$ | Cubic Metre |

# 1 INTRODUCTION

SITA Australia (SITA) wishes to develop a landfill facility in the Shire of York. The proposed facility will be located on Allawuna Farm, Saint Ronans, the location of which is shown below. It is proposed that this facility would receive putrescible waste, clean fill, Type I & II Inert Waste, contaminated solid waste[1] and Type I & II Special Waste. The facility will accept up to 250,000 tonnes of waste annually.


## 1.1 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a standard set of instructions and procedures that should be adopted for vermin management during the operation of the landfill facility owned by SITA. All staff at the facility are expected to understand and follow the procedures outlined.

## 1.2 SURROUNDING LAND USES

Two properties in the vicinity of Allawuna Farm have been identified in the DAFWA sensitive sites database. One is listed as a bio-dynamic site and the other as an organic site. The property boundary of the bio-dynamic site is approximately 700 m from the Allawuna Farm property boundary and 2.5 km from the proposed landfill footprint. The organic site is approximately 1.3 km from the Allawuna Farm property boundary and 2 km from the proposed landfill footprint.

Given the relatively large buffer distances between these properties and the proposed landfill and the planned management strategies for potential emissions originating from the landfill, the proposed development is expected to have no impact on either of the sensitive surrounding land uses identified.

## 1.3 OPERATING SCHEDULE

It is proposed that the facility will operate from 6 am to 5 pm Monday to Friday and from 6 am to 4 pm on Saturdays. The Saturday schedule will be followed for public holidays but the site will remain closed for New Year's Day, Good Friday and Christmas Day.

[1] Meeting waste acceptance criteria specified for Class II landfills.

## 1.4 QUALITY ASSURANCE

SITA has a certified system for the management of the Environment (ISO 14001), Health and Safety (AS 4801) and Quality (ISO 9001). The management processes at Allawuna Farm Landfill will tie into these certified systems.

## 1.5 LANDFILLING

The placement and covering of waste will be in accordance with the Victorian Best Practice Environmental Management (VIC-BPEM) guidelines for landfills. Cover material and internal roads will be made from material excavated during cell construction or waste materials with appropriate properties for vehicle traffic such as builders' rubble, crushed concrete or shredded wood (on the landfill area).

The strategies employed will aim to prevent windblown litter, control birds and prevent vermin at the site. The waste will be placed by maintaining one active tipping area that is as small as possible. The landfill will be effectively compacted to minimise long term settlement and maximise the use of the available airspace. The compactor will make three to five passes over waste that has been placed in 500 mm layers. Emplaced waste will be completely covered at the end of each day.

# 2 VERMIN MANAGEMENT PLAN

## 2.1 OBJECTIVE

To ensure that best practicable measures are in place to control vermin on site in order to prevent infestations which would adversely affect the environment values or the health, welfare or amenity of people, staff and nearby land users by meeting accepted guidelines, standards and criteria.

## 2.2 NECCESSITY FOR VERMIN MANAGEMENT

Landfills are by nature attractive sites for vermin infestations due to the presence of food wastes and still waters. If uncontrolled, pests such as flies, mosquitoes, rats, cats and birds can affect public health and surrounding ecosystems. The main reasons for the management of pests have been outlined by the Department of Parks and Wildlife (DPaW) as:

- to protect and maintain key environmental and other assets/values;
- being a good neighbour to adjoining landholders;
- to comply with required legislation and codes;
- to mitigate the transmission of disease vectors;
- to reduce the economic impact of pests; and
- to reduce the impact of pests on opportunities for public use and amenity.

## 2.3 PROCEDURE

### 2.3.1 Rodents

The services of a specialist pest control contractor will be engaged to provide a pest prevention service for rodents. The contractor will visit the site approximately eight times per year to carry out inspections and servicing of bait boxes which will be installed around the site infrastructure and landfill footprint. The contractor will provide an inspection sheet for each site visit. The inspection sheets will be kept on file along with the following information:

- Material Safety Data Sheets (MSDSs) for rodenticides used;
- details of operator training and qualifications; and
- map showing the locations of all on-site bait stations.

The following precautions will be employed to minimise the likelihood of the baiting system causing secondary poisoning of other species:

- First generation warfarin-based anti-coagulant poisons will be employed which have been shown to reduce the risk of secondary poisoning;
- Rodenticides will be housed in clearly-marked and tamperproof bait stations that will be checked regularly for damage and replaced as needed;
- Dead rodents will be removed as soon as they are discovered to prevent scavengers from ingesting them; and

- the storage and disposal of empty rodenticide containers will be conducted in accordance with the *Guidelines for the safe use of pesticides in non-agricultural workplaces (2007)* and *AS 2507-1998 The storage and handling of agricultural and veterinary chemicals*.

### 2.3.2 Feral Cats

Feral cats pose a significant problem to native Australian wildlife and efforts to control populations have had varying success. They are present Australia-wide under all climatic extremes and in vastly different types of terrain. Landfills present an attractive habitat for feral cats due to the presence of food waste and possible prey[2], and the opportunistic nature of the cats' predation tactics.

The main methods for the control of feral cats have been summarised in **Table 1** below.

**Table 1: Control methods for feral cats.**

| Method | Description |
|---|---|
| Exclusion | Regular boundary fencing has failed to stop the spread of feral cats in a wide variety of contexts. Feral cats have been successfully prevented from climbing over netted fences that incorporate an electric wire mounted 15cm from the top and 10cm outward from the fence. Non-electrified fencing should utilise a netted ceiling or curved overhang to prevent cats from climbing straight over the fence. |
| Shooting | Night shooting is an effective method for controlling feral cats due to their distinctive green eye-shine. Fox whistles have been used to great effect to attract feral cats for culling. |
| Poisoning | Fresh meat baits containing 1080 poison may be used to control feral cats under an Australian Pesticides and Veterinary Medicines Authority (APVMA) permit. It must be noted that only authorised persons can supply and use 1080 baits. |
| Lures | Audible recorded lures for feral cats mimic the distress call of a small animal and can be used to draw a predator to a bait or trap site. |
| Trapping | For true feral cats, leg-hold traps similar to those used for dingoes and foxes have proven to be quite effective. Semi-feral cats are easily trapped in wire 'treadle-type' box traps. |

SITA will engage the services of an appropriately qualified and experienced animal control contractor on an 'as needed' basis to ensure that feral cats do not become a problem at the Allawuna Farm landfill. It is envisaged that the contractor will conduct a site assessment and control program on a yearly basis (at minimum).

[2] Feral cats' prey include small mammals, birds, reptiles, amphibians, insects and even fish.

### 2.3.3 Birds

Birds are also classed as vermin and the common methods used to control them include:

- falcons;
- distress calls;
- Helikites[3];
- blank-firing guns; and/or
- trapping.

If required, a specialist bird control contractor will be employed to implement and maintain the bird control measures on site. These measures will be based on the contractor's expertise and experience, and as such could be subject to change, depending on what is found to be the most effective measure. The main method to control birds on site will be the progressive covering of waste during operating days and to cover all waste in accordance with the VIC-BPEM for Landfills.

Similar to those outlined in the rodent control measures, daily check sheets will be maintained on-site to record the presence of any birds and the action undertaken to manage them. In addition to this, staff will carry out a visual check for evidence of bird activity within the boundaries of the site on a daily basis. Details of these daily checks will be recorded on the daily check sheets kept in the office.

### 2.3.4 Flies

The main mechanism for the controlling of fly infestation will be via the daily covering of waste, in accordance with the VIC-BEPM. If any area of the landfill appears to be suffering from an increased fly population, then additional cover will be applied to this area in the first instance.

In the unlikely event that this control measure does not successfully control the fly population, fly spraying will be employed. The following precautions and procedures will be implemented in order to minimise the occurrence of secondary poisoning in the surrounding environment:

- spraying to be carried out by appropriately trained and qualified personnel equipped with the requisite personal protective equipment (PPE);
- only the affected areas will be sprayed (i.e. the working face or the cover mats);
- fly spraying will only take place in favourable weather conditions (i.e. wind speeds between 3-15 km/h, wind direction away from sensitive areas, no temperature inversion layer present and temperatures below 28 °C); and
- fly spraying will not take place in the vicinity of any watercourses.

Details of any fly spraying undertaken will be recorded on the daily site condition report. Copies of operators' training qualifications and the MSDSs for any insecticides used will be kept in the on-site office.

[3] Combination of a kite and a helium balloon that exploits both wind and helium for its lift.

# 3 CONCLUSION

It is considered that the measures identified above will reduce and control the instances of vermin infestation at the Allawuna Farm landfill. Given the fact that the landfill will be operated in accordance with the VIC-BPEM (daily cover, minimised active tipping face etc.), it is believed that vermin and pests will not be a significant issue in the day-to-day operation of the proposed facility.

# 4 REFERENCES

Environmental Protection Authority, 2005. Guidance Statement No 3, Separation Distance between Industrial and Sensitive Land Uses.

Department of Health, 2007. Guidelines for the safe use of pesticides in non-agricultural workplaces.

Standards Australia, 1998. The storage and handling of agricultural and veterinary chemicals, AS 2507-1998, Standards Australia, NSW.

West Australian State Government, 1984. Occupational Safety and Health Act.

Western Australian State Government, 1996. National Environment Protection Council (Western Australia) Act.

## ATTACHMENT B

**Litter Management Plan**


THE LEADER IN RESOURCE RECOVERY

# ALLAWUNA FARM LANDFILL – LITTER MANAGEMENT PLAN

This report describes the litter management measures proposed for the landfill facility at Allawuna Farm in the Shire of York.

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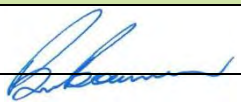
| 1 | 9/07/15 | Stefan Berger | Bruce Bowman |  |
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## TABLE OF CONTENTS

## FIGURES



## TABLES



## ACRONYMS

| | |
|---|---|
| BPEM | Best Practice Environmental Management |
| DAFWA | Department of Agriculture of Food Western Australia |
| EPA | Environmental Protection Authority |
| ENVALL | Environmental Alliances Pty Ltd |
| MRWA | Main Roads Western Australia |
| RAV | Restricted Access Vehicle |
| WA | Western Australia |

## UNITS OF MEASURE

| | |
|---|---|
| km | Kilometre |
| m | Metre |
| mm | Millimetre |

# 1 PRELIMINARIES

## 1.1 SITA AUSTRALIA

SITA Australia (SITA) wishes to develop a landfill facility in the Shire of York. The proposed facility will be located on Allawuna Farm, Saint Ronans, the location of which is shown below. The local site location is shown in **Figure 1**. It is proposed that this facility would receive putrescible waste, clean fill, Type I & II Inert Waste, contaminated solid waste[1] and Type I & II Special Waste. The facility will accept up to 250,000 tonnes of waste annually.

**Figure 1: Landfill location.**


This noise management plan outlines the measures that will be put in place to ensure that the surrounding community and SITA employees do not suffer from a loss of amenity due to noise emissions originating from within the proposed site.

## 1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a standard set of instructions and procedures that will be adopted during the operation of the landfill facility owned by SITA. All staff at the facility are expected to understand and follow the procedures outlined.

## 1.3 LOCATION

The site is located on the southern side of Great Southern Highway approximately 80 km by road from Perth and 20 km by road from York. The landfill will occupy a portion of Lot 4869 Great Southern Highway, Saint Ronans. The site is located east of the Swan Coastal Plain, in the Darling Scarp. The site was selected as the optimal choice after an investigation of nineteen potential sites undertaken by SITA.

## 1.4 NEAREST RECEPTORS AND BUFFER DISTANCES

The Environment and Protection Authority's (EPA) Guidance Statement No 3, *Separation Distance between Industrial and Sensitive Land Uses,* recommends a buffer distance of 150 metres between a Class II or III landfill and a single residence. The distance between the proposal and the nearest single residence is 1,900 metres. The Guidance Statement also recommends a buffer distance of 35 metres

[1] Meeting waste acceptance criteria specified for Class II landfills.

between a Class II or III landfill and the boundary of the property on which it is located. The proposed facility is located 600 metres from the Allawuna Farm's property boundary. **Table 1** provides a summary of the relevant buffer distances.

**Table 1: Buffer Distances**

| DESCRIPTION | BUFFER DISTANCE (m) |
|---|---|
| Minimum DER requirement for sensitive receptor land use from putrescible landfill | 500 |
| Minimum DER requirement for single residence from putrescible landfill | 150 |
| Proposed landfill to Lot Boundary | 600 |
| Proposed landfill to nearest neighbouring dwelling (single residence) | 1,900 |
| Proposed landfill to Mount Observation picnic area | 4,600 |
| Proposed landfill to Wandoo National Park | 1,000 |
| Proposed leachate dams to Thirteen Mile Brook | 270 |
| Proposed landfill to Thirteen Mile Brook | 350 |

## 1.5 CLOSEST RESIDENCE

The closest residence to the property is approximately 1.9 km to the north-east of the landfill. The next closest residence is situated 2.4 km from the proposed facility. These distances were measured using Google Earth and are an approximate only. No residences have a direct line of sight to the proposed site; all are screened by vegetation and sloping hills due to the topography of the landscape.

## 1.6 SURROUNDING LAND USES

Two properties in the vicinity of Allawuna Farm have been identified in the Department of Agriculture of Food Western Australia (DAFWA) sensitive sites database. One is listed as a bio-dynamic site and the other as an organic site. The property boundary of the bio-dynamic site is approximately 700 m from the Allawuna Farm property boundary and 2.5 km from the proposed landfill footprint. The organic site is approximately 1.3 km from the Allawuna Farm property boundary and 2.0 km from the proposed landfill footprint.

Given the relatively large buffer distances between these properties and the proposed landfill and the planned management strategies for potential emissions originating from the landfill, the proposed development is expected to have no impact on either of the sensitive surrounding land uses identified.

# 2 LITTER MANAGEMENT

Litter management is a crucial aspect of the environmentally-sound operation of a landfill. Windblown waste has the potential to cause a range of problems for the local community and environment if not managed correctly. Litter at landfill sites is largely associated with the delivery and unloading of waste rather than with compaction and burial operations.

## 2.1 LITTER CONTROLS

Litter controls will be implemented at the Allawuna Farm Landfill to keep the landfill and surrounding environment in a litter-free condition. Common litter controls that are employed at landfills around Australia and the world include:

- Mobile litter screens that are easily erected, a minimum of 1.8 m high (preferably 4 m high) and able to withstand local wind conditions whilst loaded with litter.
- All site fencing, gates and litter screen should be cleared of litter on a regular basis. Fences that are in close proximity to the active tipping face will require more frequent attention.
- Contingency plan to deal with extreme events that could instigate gross litter problems.
- Progressive application of cover material during the course of operational days to ensure that only the minimum surface area of waste is exposed at any one time.
- Independent audits of the litter control system and management plan to ensure their effectiveness.
- Implementation of an appropriate communication strategy to ensure that all site staff and contractors understand the necessity for the covering of loads.

Allawuna Farm Landfill will employ a system of mobile and immobile litter screens in combination with daily litter inspections and covering of waste. Examples of the types of fencing that will be used at the proposed facility are shown in the following Figures. The permanent fencing around the perimeter of the property will be constructed in accordance with Main Roads Western Australia (MRWA) Standard Drawings 200331-107 (Gate and Strainer Assembly Detail) and 200331-109-2 (Chainwire Fence Strainer and Post Details), which are attached as **Appendix A** and **Appendix B**, respectively. The mobile litter screens (**Figures 5 & 6**) will be deployed in accordance with **Appendices C** and **D**.

**Figure 2: Litter fencing along an internal access road.**


**Figure 3: Litter return to catch windblown waste and facilitate efficient collection.**

**Figure 4: Temporary litter screens downwind from the active tipping face.**

**Figure 5: Litter-catching fence on top of daily cover.**

The generation of litter will also be minimised by:

- Maintaining a policy of good housekeeping at the site throughout construction and operation phases,
- Ensuring the site is maintained in a secure manner using fences and gates so that only authorised vehicles and persons can enter the site,
- All waste transport vehicles will have their loads covered at all times except when unloading,
- Repair of any damage to the fence or litter screens will be undertaken as soon as practical after discovering the damage,
- Any waste that has been washed away by stormwater or blown away from the tipping area will be collected and returned to the tipping area on a monthly basis, or more frequently if required,
- Supervisory staff will be trained in, and familiar with, the guidelines issued by the DER on waste acceptance and the requirements of the site landfill *Licence*,
- A speed limit will be enforced at the site, to limit the potential for materials loss (litter) from vehicles,
- Only one tipping face will be active at any one time, with the surface area of the active tipping face kept as small as possible,
- Frequent inspections of the tipping face will be undertaken by the Site Manager,
- Delivered waste will be landfilled, compacted and covered promptly upon receipt,
- Adequate mobile plant equipment will be maintained on-site for the placement, compaction and covering of waste. An adequate supply of daily cover materials is also readily available on-site,
- Daily meteorological monitoring will be performed to assist with the planning and management of litter,
- During dry and windy conditions the active tipping area will be kept damp by watering,
- Daily cover (soil) or an approved alternative cover will be deposited over the putrescible waste at the end of every working day. No putrescible waste surfaces will be left uncovered for more than 12 hours,
- Relocatable temporary litter fences will be installed around the active tipping face,
- Dedicated staff will be employed to collect windblown litter from litter fences and from around the site,
- Site boundary fences will be used to control any litter which migrates outside the working area,
- Regular inspections will be performed of the site boundary fences, with collection of litter around the site boundary and beyond, specifically targeting ditches and access/haul roads,
- Completed cells will be capped promptly once design height has been reached,
- Waste vehicle operators will be required to inspect their vehicles prior to leaving the site to ensure all doors are securely closed and no waste debris is left on the vehicle, and
- A complaints register will be maintained, detailing any reported litter emissions and response action taken.

## 2.2 EXTREME WEATHER EVENTS

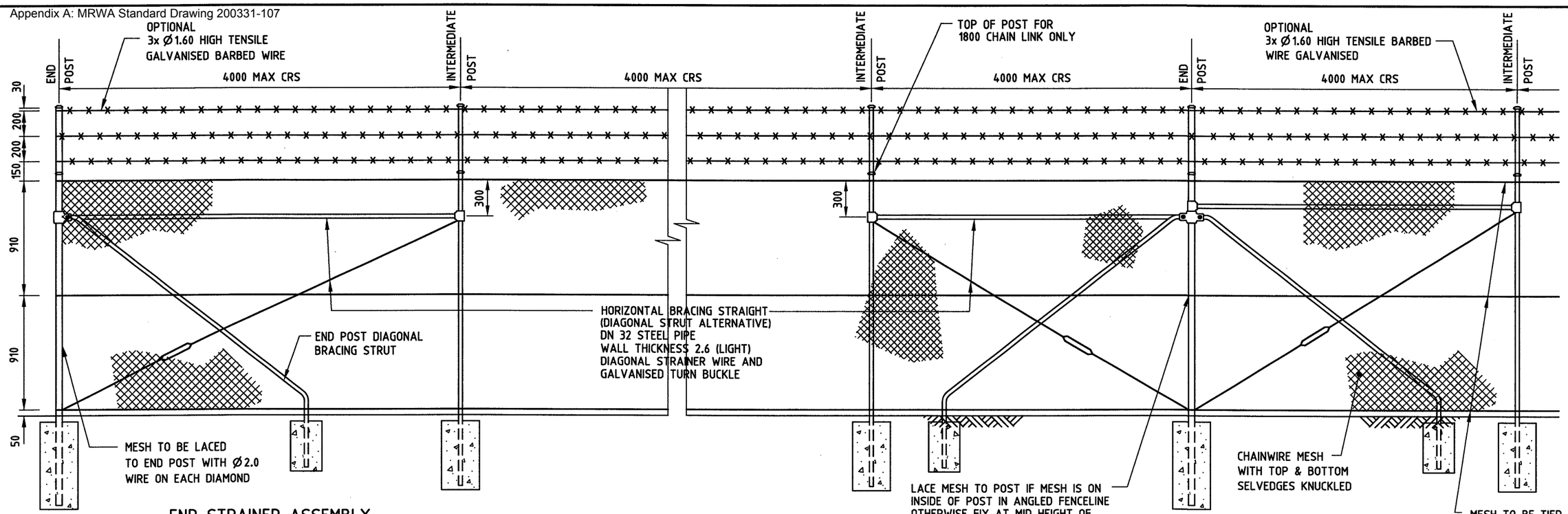
Extreme weather events (such as very strong winds) can lead to excessive litter mobilisation which may require more extensive litter collection. In the event of excessive litter, additional staff will be mobilised from an approved labour hire supplier to facilitate the prompt collection of windblown waste. Known areas will be examined and cleared of all litter in the following order:

1. Waterways onsite and offsite.
2. Great Southern Highway.
3. Neighbouring properties (farmland to the north, south and east, nature reserve to the west).
4. Site access road.
5. Allawuna Farm property.

The Allawuna Farm Landfill Operations Manager, in consultation with SITA management, may cease delivery of all or selected wastes until the extreme weather conditions have passed.

# 3 REFERENCES

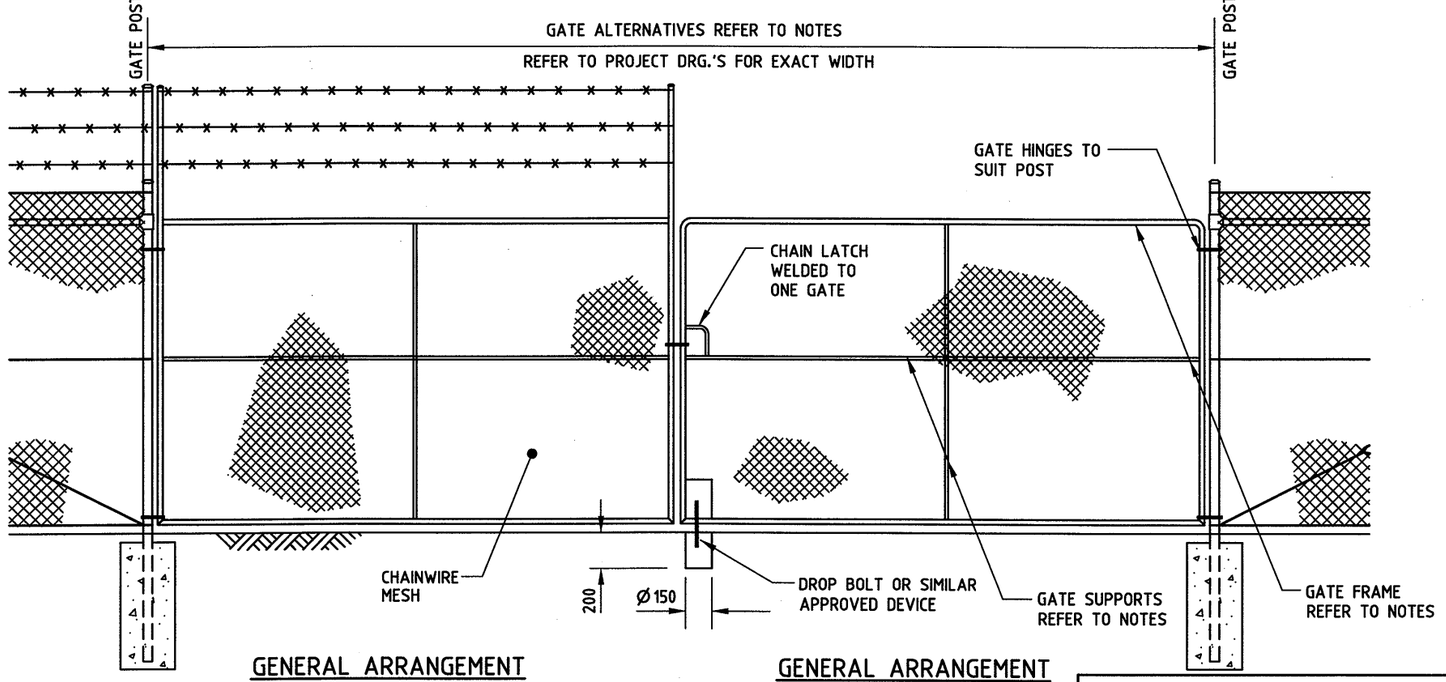
Environmental Protection Authority, 2005. Guidance Statement No 3, Separation Distance between Industrial and Sensitive Land Uses.




## END STRAINER ASSEMBLY

## CORNER STRAINER ASSEMBLY

FOR GUIDANCE ON USE REFER TO REFERENCE DRAWINGS




## GENERAL ARRANGEMENT
3 BARBED

## GENERAL ARRANGEMENT
NON BARBED

| COATING OPTION | | |
|---|---|---|
| | PVC COATED | GALVANISED |
| CHAINWIRE MESH | 1800x50xØ3.15<br>PVC COATED | 1800x50xØ3.15<br>GALVANISED |
| STRAINER WIRE | SINGLE Ø4.0<br>HELICOIL<br>PVC COATED | SINGLE Ø4.0<br>HELICOIL<br>GALVANISED |
| Ø2.0 MESH TIE WIRE | PVC COATED | GALVANISED |
| STEEL PIPE<br>PRESSED CAP<br>CLIP TEE | POWDER COATED | GALVANISED |

## NOTES

1. FENCING TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1725 AND SPECIFICATION.
2. DIMENSIONS SHOWN ON THIS DRAWING ARE TYPICAL.
3. WIRE DIAMETER AND PIPE WALL THICKNESSES ARE WITHOUT GALVANISING.
4. FOR DIMENSIONS AND OTHER DETAILS OF GATES, STRAINERS AND POSTS REFER TO THE REFERENCE DRAWINGS.
5. ALL WIRE TO BE JOINED BY FIGURE OF 8 KNOT OR WIRE JOINERS AS PER INDUSTRY STANDARD.

| REFERENCE DRAWINGS | |
|---|---|
| STRAINER AND POST DETAILS | 200331-109 |

SUPERSEDED DRAWINGS
THIS DRAWING SUPERSEDES DRAWING 9331-0385 AND 9331-0386.

ALL UNITS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

SCALE NOT TO SCALE

MICROFILM DATE

A3

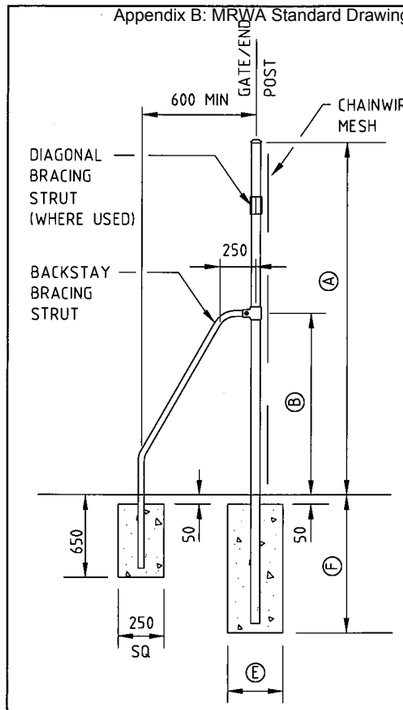
| No. | DESCRIPTION | APPROVED & DATE |
|---|---|---|
| | AMENDMENTS | |

Government of Western Australia
MAIN ROADS Western Australia
TECHNOLOGY AND ENVIRONMENT DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4449

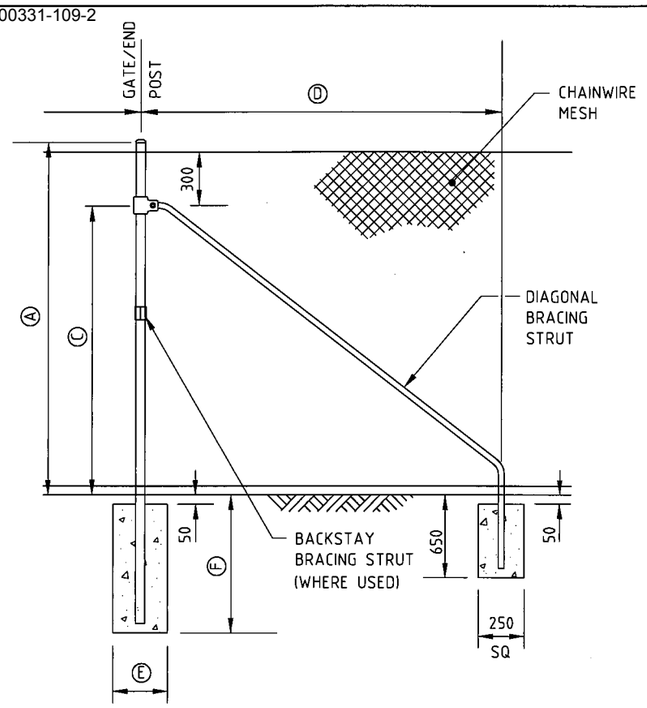
STANDARD DRAWING

1800 CHAINWIRE FENCE
GATE AND STRAINER ASSEMBLY DETAILS

DESIGNED MILISAV VASEV 14.06.05 VERIFIED 15/6/05
DRAWN ROAD AND TRAFFIC ENGINEERING APPROVED 15/6/05
FILE NUMBER 67-08-24
DRAWING NUMBER 200331-107 AMENDMENT



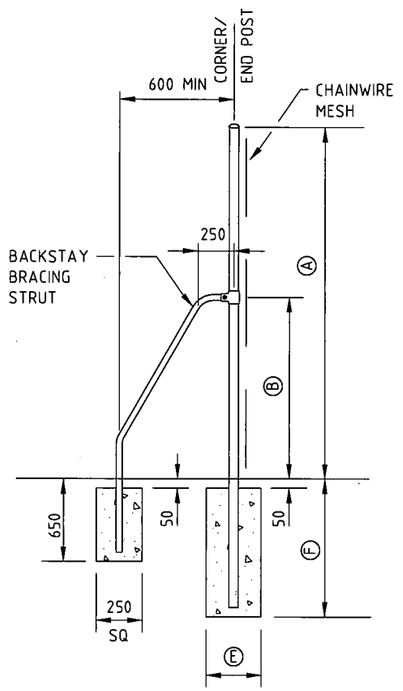

BACKSTAY DETAILS



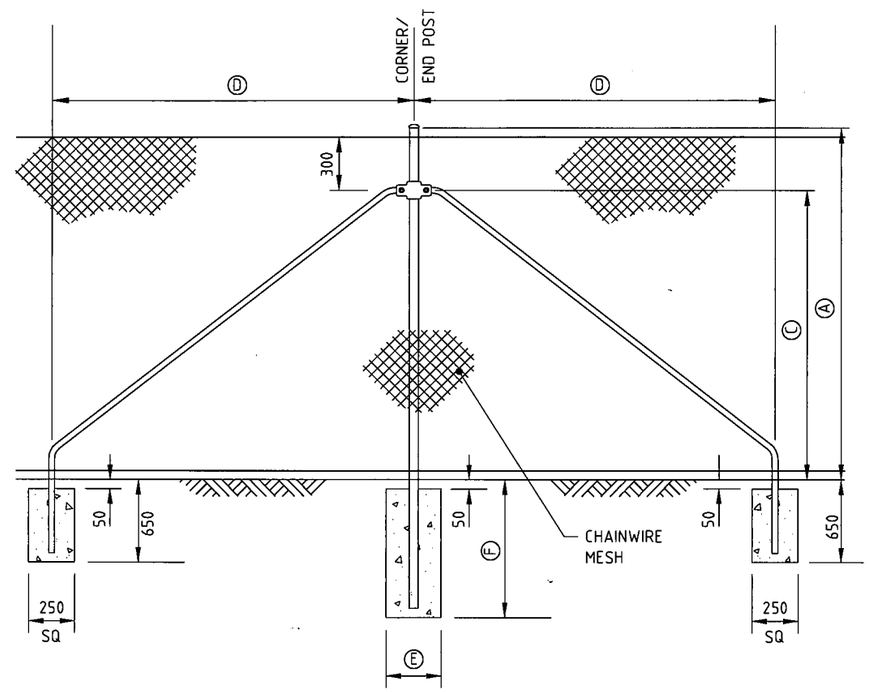

DIAGONAL BRACE DETAILS

## GATE AND END POST

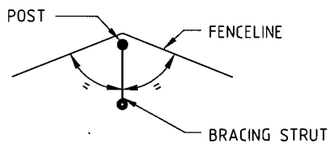
(FOR OTHER DIMENSIONS REFER TO TABLE 1)




BACKSTAY - PROFILE

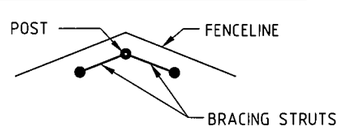



DIAGONAL BRACE - ELEVATION




BACKSTAY - PLAN

ALTERNATIVE TO DIAGONAL BRACE FOR CHANGES IN FENCE DIRECTION UP TO 30°



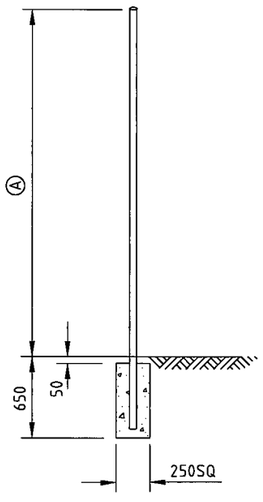

DIAGONAL BRACE - PLAN

ALSO USED ON LONG STRAIGHTS - REFER TO NOTES

### SUPERSEDED DRAWINGS

THIS DRAWING SUPERSEDES DRAWINGS 9331-0383, 9331-0386 and 9331-0389.

| REFERENCE DRAWINGS | |
|---|---|
| GATE AND STRAINER ASSEMBLY DETAILS (1200mm CHAINWIRE FENCE) | 200331-106 |
| GATE AND STRAINER ASSEMBLY DETAILS (1800mm CHAINWIRE FENCE) | 200331-107 |
| GATE AND STRAINER ASSEMBLY DETAILS (2400mm CHAINWIRE FENCE) | 200331-108 |




## INTERMEDIATE POST

USE ON STRAIGHTS
(FOR OTHER DIMENSIONS REFER TO TABLE 1)

## CORNER STRAINER ASSEMBLY

USE WHERE THERE IS A CHANGE IN DIRECTION OF FENCELINE.
(FOR OTHER DIMENSIONS REFER TO TABLE 1)

### STEEL PIPE AND FOOTING PROPERTIES FOR GATE AND END POSTS

| DESCRIPTION | 1200 CHAINWIRE | 1400 CHAINWIRE | 1800 CHAINWIRE NON-BARBED | 1800 CHAINWIRE BARBED | 2400 CHAINWIRE | FOOTING SIZE 'E'x'F' | GATE FRAME | GATE SUPPORT |
|---|---|---|---|---|---|---|---|---|
| DIMENSION 'A' | 1200 | 1400 | 1930 | 2450 | 2550 | - | - | - |
| DIMENSION 'B' | 900 | 1100 | 1250 MIN | 1250 MIN | 1250 MIN | - | - | - |
| DIMENSION 'C' | 900 | 1100 | 1500 | 1500 | 2100 | - | - | - |
| DIMENSION 'D' | 1200 MIN | 1400 MIN | 1800 MIN | 1800 MIN | 2400 MIN | - | - | - |
| END AND CORNER POSTS | DN50/2.9(L)/1950 | DN50/2.9(L)/2200 | DN50/2.9(L)/2680 | DN50/2.9(L)/3200 | DN50/2.9(L)/3300 | 250SQx800 | - | - |
| INTERMEDIATE POSTS | DN32/2.6(L)/1800 | DN32/2.6(L)/2000 | DN32/2.6(L)/2530 | DN32/2.6(L)/3050 | DN32/2.6(L)/3150 | AS SHOWN | - | - |
| SINGLE GATE POSTS | DN50/2.9(L)/1950 | DN50/2.9(L)/2200 | DN50/2.9(L)/2680 | DN50/2.9(L)/3200 | DN50/2.9(L)/3300 | 300SQx800 | DN25 | N/A |
| DOUBLE GATE POSTS - UP TO 6000 | DN50/3.6(M)/2200 | DN50/3.6(M)/2400 | DN50/3.6(M)/2930 | DN50/3.6(M)/3450 | DN50/3.6(M)/3550 | 300SQx1050 | DN25 | DN20 |
| DOUBLE GATE POSTS - 6000-8000 | N/A | DN80/4.0(M)/2500 | DN80/4.0(M)/3030 | DN80/4.0(M)/3550 | DN80/4.0(M)/3650 | 400SQx1150 | DN32 | DN25 |
| DOUBLE GATE POSTS - 8000-10000 | N/A | DN100/4.5(M)/2600 | DN100/4.5(M)/3130 | DN100/4.5(M)/3650 | DN100/4.5(M)/3750 | 450SQx1250 | DN40 | DN32 |
| DIAGONAL AND BACKSTAY BRACE STRUTS | | DN32/2.6(L)/LENGTH AS REQUIRED | | | | AS SHOWN | - | - |

KEY: 'DN50/2.9(L)/1950' REFERS TO STEEL TUBE Φ50/2.9mm WALL THICKNESS (LIGHT)/1950 LONG.

TABLE 1 (2)

### NOTES

1. FENCING TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1725 AND THE SPECIFICATION.
2. DIMENSIONS SHOWN ON THIS DRAWING ARE TYPICAL.
3. WIRE DIAMETER AND PIPE WALL THICKNESSES ARE WITHOUT GALVANISING.
4. POSTS TO BE VERTICAL WITH TOLERANCE 1 : 50 AND WITH PRESSED INDENTED CAPS.
5. CHAINWIRE MESH TO HAVE TOP & BOTTOM SELVEDGES KNUCKLED.
6. CHAINWIRE MESH IS TO BE LOCATED ON THE SIDE OF POST AS INDICATED IN THE SPECIFICATION AND DRAWINGS.
7. STRAINER WIRE TO BE TENSIONED BETWEEN ANCHORAGE POINTS.
8. DIAGONAL BRACING TO BE USED AT MAXIMUM SPACING OF 150m ON ALL LONG STRAIGHTS.
9. ALL WIRES TO BE JOINED BY FIGURE OF 8 KNOT OR WIRE JOINERS AS PER INDUSTRY STANDARD.

NOT TO SCALE

SCALE

MICROFILM DATE

A3

ALL UNITS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

| No. | DESCRIPTION | APPROVED & DATE |
|---|---|---|
| 2. | TABLE 1 - DIMENSION '1400' ADDED | R. GROVE 10.03.06 |
| 1. | TABLE 1 - DIMENSION 'D' FOR 1200 | |

AMENDMENTS

Government of Western Australia
MAIN ROADS Western Australia
TECHNOLOGY AND ENVIRONMENT DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4449

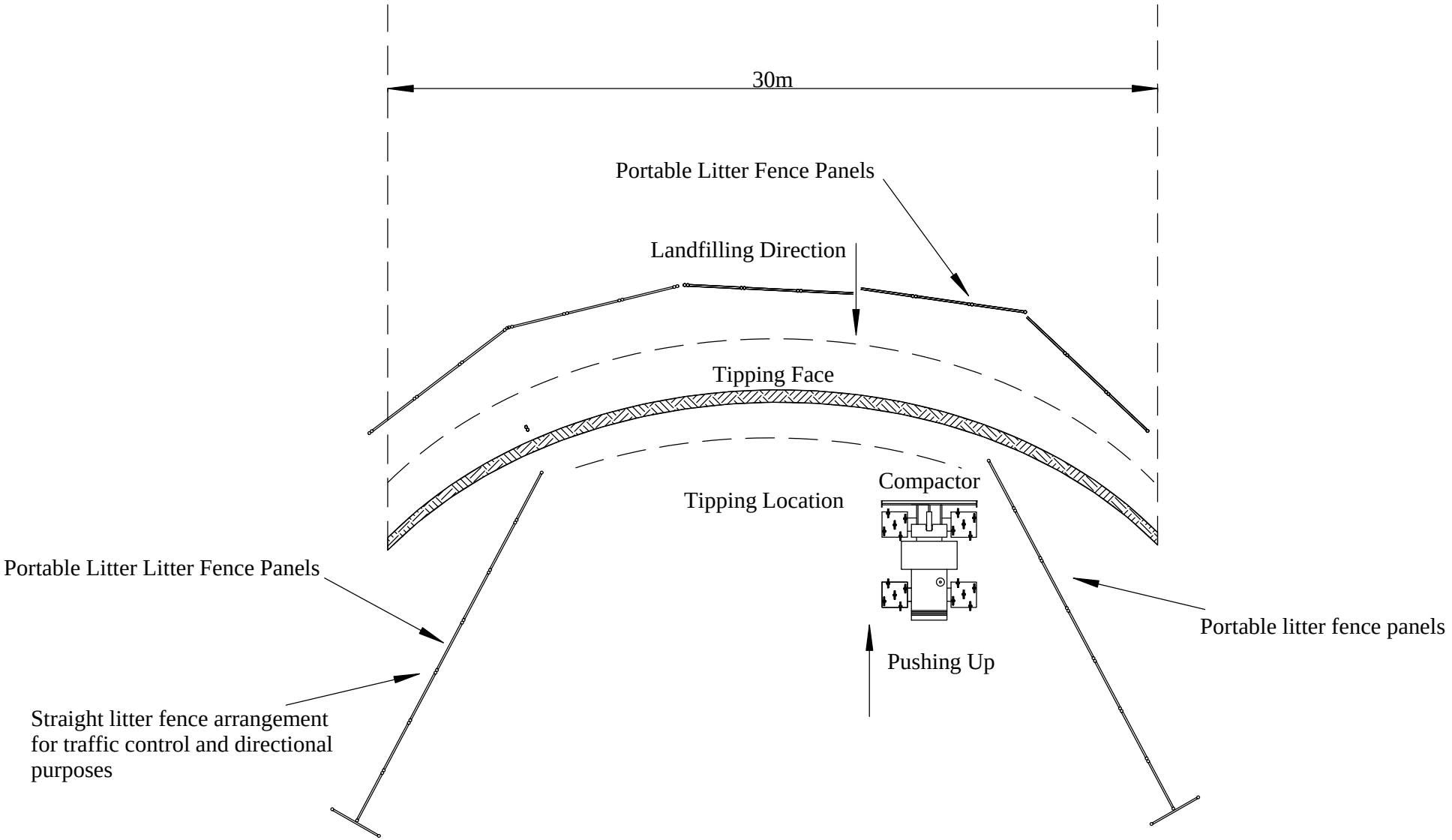
STANDARD DRAWING

CHAINWIRE FENCE
STRAINER AND POST DETAILS

| | | | |
|---|---|---|---|
| DESIGNED MILISAV VASEV | 14.06.05 | VERIFIED J. KARPINSKI | 15/6/05 |
| DRAWN ROAD AND TRAFFIC ENGINEERING | | APPROVED W. CANNELL | 15/6/05 |

FILE NUMBER 67-08-24

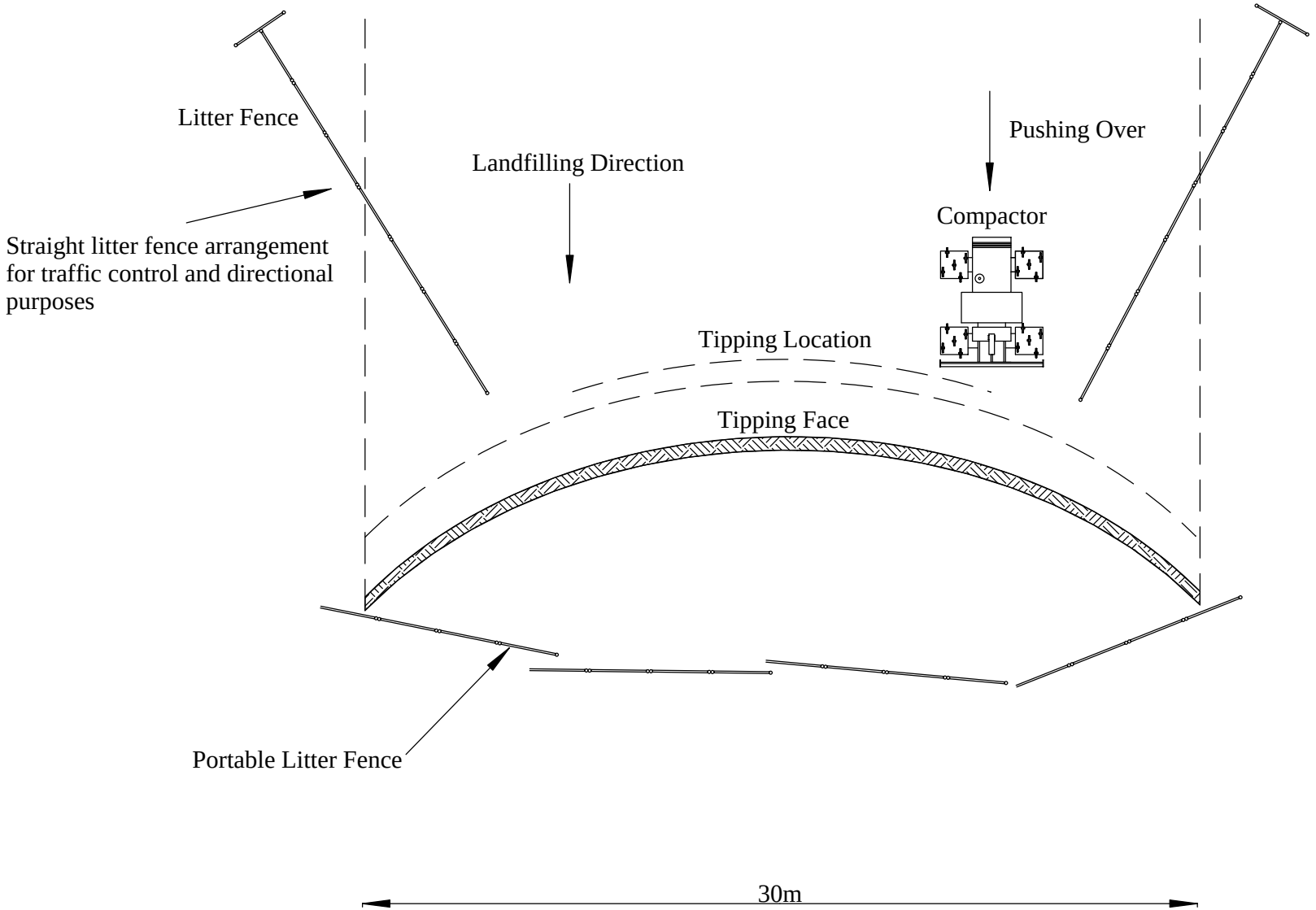
DRAWING NUMBER 200331-109-2 AMENDMENT




Bowman and Associates Pty Ltd
ABN: 22 112 399 514
PO Box 2059
Rossmoyne WA 6148
Phone: 08 9414 9670

| Project | Location | Drawing Title | Original Drawing Size |
|---|---|---|---|
| Litter Management Plan | Allawuna Farm Landfill | Litter Fence - Push Up | A4 |

| Date | Scale | Drawn By | Client | Drawing Number | Version |
|---|---|---|---|---|---|
| 2.07.15 | Not to Scale | Bruce Bowman | Sita Australia Pty Limited | 150702BBPU | 1 |




Bowman and Associates Pty Ltd
ABN: 22 112 399 514
PO Box 2059
Rossmoyne WA 6148
Phone: 08 9414 9670

| Project | Location | Drawing Title | Original Drawing Size |
|---|---|---|---|
| Litter Management Plan | Allawuna Farm Landfill | Litter Fence - Push Over | A4 |

| Date | Scale | Drawn By | Client | Drawing Number | Version |
|---|---|---|---|---|---|
| 2.07.15 | Not to Scale | Bruce Bowman | Sita Australia Pty Limited | 150702BBPO | 1 |

# ATTACHMENT C1

## Asbestos Waste Management Plan

# ASBESTOS WASTE MANAGEMENT - Allawuna

**WI063.4**

## PURPOSE AND SCOPE

| | |
|---|---|
|  | To outline the requirements for the acceptance and handling of asbestos waste at the Allawuna Landfill to ensure the health and safety of all workers<br><br>This work instruction applies to all SITA and contractor staff involved in asbestos management on site. |

## KEY HAZARDS

| | |
|---|---|
| | • Breach of legislative requirements<br>• Breach of DER licence conditions<br>• Personal exposure to asbestos resulting in disease (asbestosis, lung cancer or mesothelioma) |

## PPE REQUIREMENTS


EYE PROTECTION


PROTECTIVE BODY CLOTHING


HAND PROTECTION


FOOT PROTECTION


Half-Face Respirator

## KEY ACTIONS

| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **General Requirements** | | |
| 1. | In Western Australia the transportation and disposal of asbestos containing materials is regulated by the Environmental Protection (Controlled Waste) Regulations 2004.<br><br>The Regulations define what is considered to be asbestos containing materials. This definition includes material which contains 0.001% or more of asbestos fibres weight/weight. | Note |
| 2. | The Allawuna Landfill only accepts waste from customers who have an account. | Note |

| | | | |
|---|---|---|---|
| 3. | Customers enquiring into disposal of asbestos waste at site must be informed the following;<br>- 24 hours' notice must be provided<br>- Written notification that the waste is, or contains asbestos must be provided on delivery to site<br>- Waste must be appropriately wrapped, labelled and wet down (where appropriate) as per the regulations<br>- Transported in appropriate vehicle/bin |  | Weighbridge Operator / Compliance Personnel / Landfill Manager |
| 4. | Workers must be appropriately trained prior to undertaking any work/inspecting asbestos waste in accordance with the *Asbestos Waste* SOP. | | Site Manager |
| 5. | Workers must wear appropriate PPE when working with/inspecting asbestos loads in accordance with the requirements of the *Asbestos Waste* SOP. | | Site Manager |
| **Receipt of Asbestos at the Weighbridge** | | | |
| 6. | Every Asbestos load must be visually inspected prior to unloading to verify that it has been packaged in accordance with the packaging requirements in the *Asbestos Waste* SOP. | | Weighbridge Operator |
| 7. | Asbestos waste must be transported in a Roll-on Roll-off or crane lift bin or must be manually unloaded.<br><br>Unloading from tip trucks or marell bins is **not** permitted. |  | All Workers |
| 8. | Reject the load if it is not in an appropriate vehicle or if it is not properly packaged. Details of the load must be recorded in the "Rejected Loads" folder. | | Weighbridge Officer/ Compliance Personnel |
| 9. | Advise staff at the tipping face via the UHF radio system of the arrival of an asbestos load.<br>Release the load **ONLY** after confirmation from the tipping face and the nominated person witnessing the unloading of waste. | | Weighbridge Officer/ Compliance Personnel |
| 10. | Clients/Drivers who repeatedly violate the requirements of this procedure will be refused acceptance on a permanent basis. | | Site Manager |
| **Unloading at the Tipping Face** | | | |
| *Bagged Asbestos* | | | |
| 11. | Vehicles delivering asbestos must allow for bags or sheeting to be placed directly on the landfill surface without 'free falling' to the ground, to minimise the likelihood of damage to the packaging. | | Plant Operator |
| 12. | Record the burial location of waste on the Asbestos Burial Log using a GPS device. This is logged annually onto a premise map and provided to the DER. | | Compliance Personnel |
| 13. | A SITA employee must be present to witness each asbestos burial and sign the *Asbestos Burial Log* to attest that it has been carried out in accordance with the licence conditions. This must be completed within 2 hours of covering taking place. | | SITA Workers |

| | | |
|---|---|---|
| | Witness must view burial at a safe distance either within a vehicle or upwind from burial. Witness should be checking to ensure packaging maintains integrity and is buried as per licence. | |
| 14. | Asbestos must not be placed within:<br>• 2 metres of the landfill cell liner floor,<br>• 3 metres of the landfill cell liner wall,<br>• 5 metres of an intermediate batter,<br>• 2 metres of any intermediate cover, and<br>• 2 metres of final tipping surface of landfill. | Plant Operator |
| 15. | As soon as is practicable and before compaction, cover the asbestos with a layer of soil at least 300mm thick or with a layer of dense, inert and incombustible material at least 1 metre thick. | Plant Operator |
| 16. | In the event of the escape of asbestos during handling or unloading, follow the escape of asbestos waste procedures in the *Asbestos Waste* SOP | Worker |

## RELATED DOCUMENTS

Asbestos Waste SOP029
Asbestos Burial Log – site specific

## REVIEW AND DOCUMENT CONTROL

| VERSION | CHANGE | REVIEWED | AUTHORISED | DATE |
|---|---|---|---|---|
| 1 | Initial issue – extracted from Appendix D of SOP029 | EQS Coordinator | Team Leader Safety Systems | 29/6/15 |
| | | | | |
| | | | | |

WORK INSTRUCTION

# ASBESTOS WASTE - IDENTIFICATION, ISOLATION AND CONTAINMENT - WESTERN AUSTRALIA

**WI062.6**

## PURPOSE AND SCOPE

| | |
|---|---|
|   | To outline the requirements for the identification, isolation and containment of asbestos at facilities within Western Australia. The instruction is applicable to Welshpool Resource Recovery Facility (WRRTF), Western Recycling Landsdale Transfer Station (WRLTS) and Busselton and Allawuna.<br>This work instruction applies to all workers involved in asbestos identification, isolation and containment on site. |

## KEY HAZARDS

| | |
|---|---|
|  | • Breach of legislative requirements<br>• Breach of DER licence conditions<br>• Personal exposure to asbestos resulting in disease (asbestosis, lung cancer or mesothelioma) |

## PPE REQUIREMENTS





## KEY ACTIONS

| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **Site Information** | | |
| 1. | The Western Recycling-Landsdale Transfer Station (WRLTS) does not accept asbestos waste on site. General waste and commercial and demolition (C&D) waste has the potential to contain asbestos or asbestos containing materials. | Note |
| 2. | The Welshpool Resource Recovery & Treatment Facility (WRRTF) doesn't accept asbestos waste although it is licenced to accept this waste stream. General waste has the potential to contain asbestos or asbestos containing materials. | Note |
| 3. | Busselton – is a sorting facility specifically for C&D waste. C&D waste has the potential to contain asbestos or asbestos containing materials. | Note |
| 4. | Allawuna – is a landfill licenced to accept asbestos waste (see WI63.4 for acceptance and disposal). This work instruction outlines the procedures to follow if asbestos or asbestos containing materials are found in waste streams. | Note |
| **General Requirements** | | |
| 4. | Customers transporting high risk waste streams such as C&D are required to sign a Customer Declaration (refer to appendices in the site specific Waste Acceptance Manual) stating the load is free from asbestos. The declaration requires details relating to the source of load, age of the building (if possible) and the type of load. | Note |
| 5. | Where SITA collects waste from a customer they are required to sign contractual obligations as detailed in the SITA standard "Terms and Conditions of Supply". This specifies that customers must not place special wastes (including asbestos) in general waste bins (such as C&D bins).<br><br>There is also a contractual obligation on the customer to accept return, at the customer's expense, of any special waste (including asbestos) unless SITA has agreed to accept that special waste. | Note |
| 6. | Workers must have asbestos training, as outlined in the site specific Waste Acceptance Manual, be trained in this work instruction and the relevant sections of the *Asbestos Waste – Transport, Receipt and Disposal SOP*. | Site Manager |
| 7. | Workers must follow the instructions outlined below to ensure general waste and C&D waste are inspected and managed to prevent asbestos contamination. | Operator |
| 8. | PPE required for asbestos handling must include:<br>• a half face respirator with a P3 filter,<br>• disposable coveralls,<br>• safety googles,<br>• single use disposable gloves (e.g.: powder free latex or nitrile gloves), and<br>• disposable overshoes or washable boots (e.g.: steel capped boots or gumboots). Laced boots are **not** permitted. | Operator |
| **Identification of Asbestos in Incoming General Waste** | | |
| 9. | General waste streams will be monitored for asbestos. If asbestos is suspected the worker must stop all operations in the area, put on the PPE listed above and view the waste to establish if it is asbestos. | Operator |
| 10. | Any load that is found to contain asbestos must be isolated and contained as instructed below under the section relating to the Isolation and Containment of Asbestos. | Site Manager / Operator |

<table>
<tr><th colspan="3">Identification of Asbestos in Incoming C&D Waste</th></tr>
<tr><td>11.</td><td>Every load of C&D waste must be visually inspected for asbestos.</td><td>Operator</td></tr>
<tr><td>12.</td><td>Based on the information from the Customer Declaration the load is categorised as either low or high risk.<br><br>The C&D Waste Monitoring and Inspection Form (refer to appendices in the site specific Waste Acceptance Manual) records the inspection, resulting actions and contains information to how to categorise C&D waste.<br><br>Below is a table outlining the waste categories.<br><br>
<table>
<tr><th colspan="3">C&D Waste Category Assessment</th></tr>
<tr><th>Material Type</th><th>Commercial</th><th>Skip Bin</th></tr>
<tr><td>Clean Concrete (without Form Work)</td><td>Low</td><td>High</td></tr>
<tr><td>Clean Brick</td><td>Low</td><td>High</td></tr>
<tr><td>Clean Bitumen/Asphalt</td><td>Low</td><td>High</td></tr>
<tr><td>Mixed Construction Waste</td><td>High</td><td>High</td></tr>
<tr><td>Mixed Demolition Waste</td><td>High</td><td>High</td></tr>
</table></td><td>Site Manager / Supervisor</td></tr>
<tr><td colspan="3">Low Risk Loads</td></tr>
<tr><td>13.</td><td>Low risk loads must be visually inspected as the load is tipped to ensure there is no asbestos present.</td><td>Operator</td></tr>
<tr><td>14.</td><td>Any load that is found to contain fibros asbestos (FA) or asbestos fines (AF) must be contained as instructed below under the section relating to the Isolation and Containment of Asbestos.</td><td>Operator / Supervisor</td></tr>
<tr><td>15.</td><td>Any load identified with asbestos containing material (ACM) must be reclassified as high risk and contained as instructed below under the section relating to the Isolation and Containment of Asbestos.</td><td>Operator/ Supervisor</td></tr>
<tr><td>16.</td><td>Any load found to be contaminated after tipping must be recorded using the Waste Contamination Form (refer to Appendix 5 in the Western Recycling-Lansdale Transfer Station Waste Acceptance Manual).</td><td>Operator</td></tr>
<tr><td colspan="3">High Risk Loads</td></tr>
<tr><td>17.</td><td>High risk loads must be visually inspected as the load is tipped. In addition the load must be spread out to 30cm thickness and a comprehensive visual inspection is carried out. This may involve turning the waste with an excavator or dozer.</td><td>Operator</td></tr>
<tr><td>18.</td><td>Any load that is found to contain FA or AF must be contained and handled as instructed below under the section relating to the Isolation and Containment of Asbestos. This includes redirection to an appropriate disposal facility (unless site is licenced to accept asbestos waste).</td><td>Operator / Site Manager</td></tr>
<tr><td>19.</td><td>Where suspect ACM is identified in a load and can be removed by hand either;<ul><li>Isolate and cover for asbestos testing. Sampling and analysis will be conducted by an authorised contractor and laboratory. If the test results show that it is not asbestos, add to the stock pile for processing. If the test results show a positive result for asbestos it must be redirected to an appropriately licenced disposal facility.</li><li>Alternatively assume the waste is ACM and contain and handle the waste as instructed below under the section relating to the Isolation and Containment of Asbestos. Redirect the waste to an appropriately licenced disposal facility.</li></ul></td><td>Operator / Site Manager</td></tr>
<tr><td>20..</td><td>If the ACM can not be easily removed by hand the load must be rejected. Isolate the waste, keep it wet and once appropriately contained as outlined below redirect the load to authorised disposal facility.</td><td>Operator / Site Manager</td></tr>
<tr><td>21.</td><td>Any load found to be contaminated after tipping must be recorded using the Waste Contamination Form (Appendix 5 in the Waste Acceptance Manual).</td><td>Operator</td></tr>
</table>

| | | |
|---|---|---|
| ***No Asbestos Identified*** | | |
| 22. | Any C&D waste found to contain no asbestos (i.e.: no FA, AF or ACM) may be added to the stockpile for processing. The stockpile must not to exceed 4000 tonnes. Stock pile testing requirements are covered within the each site specific Waste Acceptance Manual. | Operator |
| **Isolation and Containment of Asbestos** | | |
| 23. | Notify the Site Manager immediately of the asbestos contamination. | Operator |
| 24. | Isolate and contain the asbestos contaminated materials by;<br>• creating an exclusion zone of at least 5 meters around waste using barricades or tape,<br>• wet down the material if possible by spraying with a fine mist,<br><br>Note: Anyone entering the exclusion area must be wearing the correct PPE. | Operator |
| 25. | If the customer is identified contact them and ask them to organise an appropriately licenced person/contractor to package and remove the waste from site for disposal at a licenced landfill. Where asbestos contamination is identified and attributed to a customer the Waste Contamination Form (refer to the appendices in the site specific Waste Acceptance Manual) must be completed. | Site Manager / Supervisor |
| 26. | If the customer is unknown, SITA will hire an appropriately licenced contractor to package and transport the asbestos waste. To transport asbestos waste it must be appropriately wrapped and transported by a licenced vehicle and contractor. | Site Manager |
| 27. | Refer to *Asbestos Waste - Transport, Reciept and Disposal* for details on asebstos waste packaging requirements. | Note |
| 28. | If the waste is to be on site for longer than the current working day ensure it is placed in a secure area with appropriate signage. | Operator / Supervisor |
| 29. | Raise a CAR in SIMS to report the incident and undertake corrective actions. | Site Manager / Supervisor |

## DEFINITIONS

"Special Waste"; means any, radioactive, volatile, flammable, explosive, toxic, prescribed hazardous or dangerous goods or substances including asbestos, or any other goods or substances excluded from Waste by SITA's written notice to the Customer.

"AF"; Asbestos fines or fibres – includes small asbestos fibre bundles, free asbestos fibres and also ACM fragments that can pass through a 7mm x 7mm sieve.

"ACM"; Asbestos Containing Material – products or materials (including fragments) that contain asbestos in an inert bound matrix such as cement or resin in a sound condition and in a form that cannot pass through a 7mm x 7mm sieve.

"FA" Fibrous Asbestos - includes friable asbestos material, such as severely weathered ACM and asbestos in the form of loose fibrous material such as insulation products. Friable asbestos is material that is in a degraded condition such that it can be broken or crumbled to a powder form by hand pressure.

## RELATED DOCUMENTS

Asbestos Waste - Transport, Receipt and Disposal SOP029

DER Publication - Guidelines for Managing Asbestos at Construction and Demolition Waste Recycling Facilities

Waste Acceptance Manual – Western Recycling-Lansdale Transfer Station MAN009

Waste Acceptance Manual – Welshpool Resource Recovery & Treatment Facility MAN009

Waste Acceptance Manual – Busselton MAN009

## REVIEW AND DOCUMENT CONTROL

| VERSION | CHANGE | REVIEWED | AUTHORISED | DATE |
|---|---|---|---|---|
| 1 | Initial issue | EQ&S Co-ordinator | TL Safety Systems | 9/7/14 |
| | | | | |
| | | | | |

# ASBESTOS WASTE

**SOP029**

## PURPOSE AND SCOPE

| | |
|---|---|
|  | To set out key principles for the management of asbestos waste, in particular the safe handling, transport and disposal of waste in accordance with legislative requirements, and the requirements for identification and management of asbestos on site where applicable<br><br>This procedure applies to all SITA workers including agency staff and contractors engaged in the collection, transport, receipt and disposal of asbestos. |

## KEY HAZARDS

| | |
|---|---|
|  | • Personal exposure to asbestos resulting in disease (asbestosis, lung cancer or mesothelioma)<br>• Breach of legislative requirements |

## PPE REQUIREMENTS


**Note: Site specific PPE requirement may apply**

## KEY OPERATIONAL CONTROLS

*Detailed actions overleaf.*

| OPERATIONAL CONTROLS |
|---|
| ➢ Risk management practices |
| ➢ Collection and transportation requirements |
| ➢ Receipt of asbestos waste procedures |
| ➢ Safe handling and disposal of asbestos waste requirements |
| ➢ Escape of asbestos waste procedures |
| ➢ Training and supervision |

**COLLECTIONS/TRANSPORT**
Drivers must ensure that all asbestos waste is properly packaged before transporting.
Customer pick up bookings must be made 24 hours prior to delivery

**RECEIPT PROCESS**

**WEIGHBRIDGE RESPONSIBILITIES**

Ensure asbestos is appropriately packaged, sealed and transported

If not packaged, sealed or transported correctly, reject load and ask customer to leave. Complete Waste Rejection Form

If packaged correctly, where necessary, complete EPA documentation. Enter information into weighbridge computer and issue docket

Advise workers at the tipping face of delivery arrival. **ONLY** release after confirmation from spotter that operator is ready

**HANDLING AND DISPOSAL**

**OPERATOR RESPONSIBILITIES**

Ensure asbestos is appropriately packaged and sealed

Wet the waste to ensure that any dust is not stirred up.

Handling is carried out so as not to disturb or damage the packaging – Do not drop asbestos from height or push asbestos waste

**Asbestos Covering:**
ensure asbestos is covered in accordance with state legislation and license conditions

**ESCAPE OF ASBESTOS WASTE**
*In the event of an escape of asbestos waste, follow these procedures:*
- Clear the disposal area of workers and vehicles
- Notify Site Manager
- Appropriate PPE must be worn by all workers managing the spill
- Fine mist of a water hose must be used to wet asbestos and control dust
- Asbestos must not be pushed to avoid damaging the packaging
- Report asbestos waste spill in accordance with the *Incident Reporting and Corrective Action* Procedure

## 1. KEY ACTIONS – ASBESTOS SAFETY

| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **General Responsibilities** | | |
| 1. | • Ensure that this procedure is carried out appropriately<br>• Site EPA licencing and applicable transport licences/certificates are current<br>• All workers involved in the transport, identification, receipt and disposal of asbestos waste are trained and competent and aware of the possibility of asbestos exposure<br>• Where required ensure showers are available and in working order | Site Manager |
| 2. | Take reasonable care for their own health and safety and ensure that they do not adversely affect the health and safety of other persons. Comply with instructions and cooperate with this procedure. | Workers |
| **Asbestos and Work at SITA** | | |
| 3. | Asbestos is a generic term for the different varieties of mineral silicates<br><br>There are two classifications of Asbestos;<br><br>• **Friable asbestos**: asbestos in the form of a powder or which can be crumbled, pulverised or reduced to powder by hand pressure when dry, also known as lagging. Products containing friable asbestos include pipe insulation, brake lining, clutch plates and tiles.<br><br>• **Non-friable asbestos**: contains a binder that holds the asbestos fibres together and can not easily be released unless it is mishandled, damaged or badly worn or weathered. Also known as Bonded asbestos material or Sheeting, it is the most common form of asbestos and can be found in a range of products such as fencing, roofing, cement pipes and tiles | - |
| 4. | Asbestos has been used in a number of products and these products can collectively be labelled Asbestos Containing Material (ACM).<br><br>Examples of ACM include:<br>• Construction products,<br>• Paints,<br>• Plastics,<br>• Electrical insulation, and<br>• Brake and clutch linings.<br>A detailed list of Asbestos Containing Material is outlined in **Appendix A.** | - |
| 5. | SITA workers are not permitted to undertake any of the following work where asbestos is present:<br>• Demolition and/or asbestos removal work<br>• Maintenance of or service of any asbestos containing material (ACM)<br>• Laundering asbestos contaminated clothing<br>• Research, analysis or sampling of asbestos (unless trained to do so) | Site Manger / Worker |
| 6. | SITA workers may undertake the following Asbestos related work:<br>• transport of asbestos waste<br>• visual assessment of asbestos waste in waste loads<br>• disposal of asbestos waste at landfill sites | Site Manger / Worker |
| **Impact of Asbestos Exposure to Health** | | |
| 7. | Breathing in asbestos fibres can cause asbestos related diseases which can have delayed symptoms of up to 20 to 40 years, from the first exposure to the substance | - |
| 8. | Diseases caused by asbestos exposure include;<br><br>• ***Asbestosis*** – Scarring of the lung tissue attributed to inhaling substantial amounts of asbestos dust over a period of years. Airways become inflamed which makes breathing difficult and oxygen is no longer able to pass from the lungs into the blood. Symptoms include tightness in the chest, dry cough and possible bluish tint to the skin<br>• ***Mesothelioma*** – Cancer of the outer lung lining or lining of the abdominal cavity, although rare it develops and spreads quickly before any symptoms appear | - |

| | | |
|---|---|---|
| | • ***Lung Cancer*** – Cancer of the lung related to the amount of fibre inhaled, results in tumours which obstruct airways. The risk is greatly increased in people who smoke cigarettes. | |
| 9. | SITA workers undertaking asbestos related work must be monitored in accordance with the *Health Surveillance Procedure.* | Site Manager |
| **Use and Disposal of Personal Protective Equipment (PPE)** | | |
| 10. | All workers involved in the transport and disposal of asbestos waste (i.e., drivers, weighbridge operators and site operators) must be supplied with appropriate and suitable personal protective equipment and trained in its use, maintenance and storage. Following training, each person must be responsible for the maintenance and storage of their equipment or kept in a designated Asbestos Kit on site. | Site Manager |
| 11. | Owner Drivers must have their own suitable, appropriately maintained PPE. | Site Manager |
| 12. | Appropriate PPE must be worn at all times when undertaking work with asbestos. | Worker |
| 13. | Drivers must wear all appropriate PPE when outside of the vehicle | Driver |
| 14. | PPE must include:<br>• minimum P2 disposable mask (a respirator may be worn),<br>• disposable coveralls,<br>• single use disposable gloves (e.g.: powder free latex or nitrile gloves), and<br>• disposable overshoes or washable boots (e.g.: steel capped boots or gumboots). Laced boots are **not** permitted without disposable overshoes being worn<br>**Note –** special requirements exist for wearing a respirator. Refer to the Asbestos Awareness Training package for further information. | Site Manager |
| 15. | PPE must always be put on in the following order:<br>1. P2 disposable mask,<br>2. disposable coveralls,<br>3. gumboots or disposable overshoes (if applicable), and<br>4. gloves | Worker |
| 14. | Disposable coveralls must be:<br>• of a suitable standard to prevent tearing or penetration of asbestos fibres (i.e.: type 5, category 3 or equivalent)<br>• one size too big, as this will help prevent ripping at the seams,<br>• fitted with hood and cuffs, ensuring that:<br>– if cuffs are loose, they are sealed with tape,<br>– coverall legs are worn over footwear as tucking them in lets the dust in, and<br>– the fitted hood is worn over the respirator straps.<br>Coveralls must:<br>• not be made of material that is easily torn or have external pockets or velcro fastenings,<br>• never be taken home, and<br>• never be reused | Site Manager |
| 15. | PPE contaminated with asbestos must be packaged in accordance with the asbestos waste packaging requirements of this procedure (points 22-28) and disposed of at a licenced landfill. | Site Manager |
| 16. | Any PPE that is not clothing and is not disposable must be decontaminated (laundered in a suitable laundering facility) and kept in a sealed container until it is reused for the purposes of asbestos-related work | Site Manager |
| **Training Requirements** | | |
| 17. | Managers and Supervisors must be trained in this SOP | EQS Manager |
| 18. | All relevant workers on site must be trained in the following:<br>• site Specific *Asbestos Waste Management* Work Instruction (where available), and<br>• either,<br>○ internal Asbestos Awareness training which includes identification of asbestos and | Site Manager |

| | | |
|---|---|---|
| | safety precautions including PPE use, or<br>○ External Asbestos Training provided by an accredited RTO (for site workers who may be required to handle or manage asbestos waste including inspect and handle small amounts under 10m$^2$ of non-friable asbestos) | |
| 19. | Site Managers must ensure that appropriately trained personnel are on site at all times. | Site Manager |
| 20. | Workers must be made aware of shower locations and instructions for use | Site Manager |
| **Records** | | |
| 21. | Records of Asbestos health monitoring and incident reports must be kept for minimum 40 years | Site Manager |

## 2. KEY ACTIONS – ASBESTOS PACKAGING & TRANSPORT REQUIREMENTS

| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **Asbestos Waste Packaging Requirements** | | |
| 22. | Asbestos waste must be packaged and sealed prior to pick at a customer site ready for transportation or prior to receipt at a SITA disposal site. | - |
| 23. | All waste containing asbestos must be contained and packaged by the customer / public as detailed below to prevent exposure to airborne asbestos fibres.<br><br>**If asbestos waste arrives on site and is not packaged in accordance with these requirements it must not be accepted.**<br><br>No customers or members of the public are permitted to package and seal the asbestos waste on SITA sites. Where bags and packaging are purchased on site, the customer must leave the site to pack the asbestos correctly. | Site Manager / weighbridge operator |
| 24. | All Friable asbestos waste and small pieces of non-friable asbestos waste must be contained in either:<br><br>**1.** new heavy duty (200 µm – minimum thickness) polythene bags that are no more than 1200 mm long and 900 mm wide<br>a. Bags of asbestos waste must not be filled more than half full (depending on the weight of the items) and excess air should be evacuated<br>b. Bags closures must be twisted tightly and have the neck folded over and secured with adhesive tape<br>c. Friable Asbestos waste **must** be double bagged at all times<br>d. Asbestos waste bags must be clearly labelled on all sides: **Caution Asbestos, dust creation and inhalation should be avoided** (or similar wording)<br>**2.** a drum, lined with heavy duty sheeting and a lid securely fixed<br>a. Each drum must have a dangerous goods label affixed and an asbestos warning label at least three times on one side  | Worker |
| 25. | Asbestos sheeting and lagged piping & equipment (Non-friable or bonded asbestos) must be contained in new, heavy duty (200 µm – minimum thickness) polythene sheeting<br><br>The waste **must** be either:<br>**1.** double wrapped in the sheeting and adhesive tape applied to the entire length of every overlap to secure the bundles and labelled to indicate they contain asbestos, Or<br>**2.** placed directly into a skip bin or vehicle tray that has been double-lined with the sheeting (provided it is kept wet), once full skip bins are full they must be completely sealed with the sheeting | Worker |
| 26. | Asbestos contaminated soil must be kept wet at all times, in a sealed truck or container and covered | - |
| 27. | All plastic sheeting and bags must be intact with no breaks or tears. | Worker |
| 28. | All trucks must be correctly tarped and tailgates must be closed | Worker |
| **Asbestos Waste Booking** | | |
| 29. | **Customer Site Pickups -** There must be 24 hours' notice by customers for all asbestos waste collections by SITA drivers.<br><br>**Commercial Disposal and Small Vehicle Drop Offs at Landfills–** 24 hours' notice is the preferred method for receival of asbestos waste. Disposal may be made without prior notice, at the discretion of the site. | SITA Customer Service |

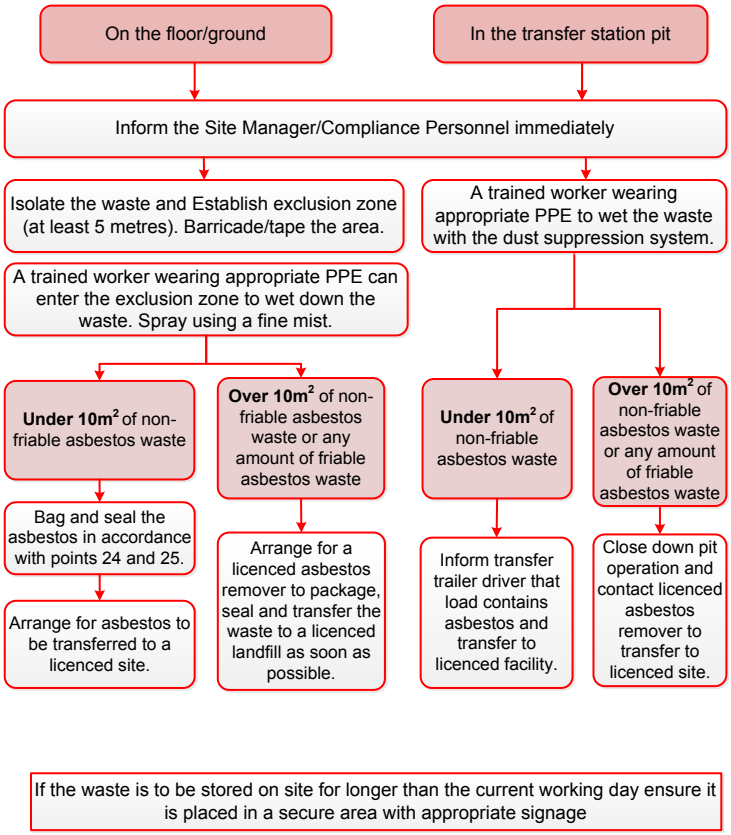
| | | |
|---|---|---|
| | **Small Vehicle Drop Offs at Designated Transfer Stations –** Receipt of asbestos may occur without prior booking at the discretion of the site. | |
| 30. | At the time of booking, the customer must be given all necessary information regarding correct packaging requirements as detailed in item 23 to 29. | SITA Customer Service |
| 31. | Large packages of asbestos waste (not able to be manually unloaded from vehicle) –will only be accepted in Roll on/Roll off bins or crane lift bins | Worker |
| **Collection and Transport of Asbestos Waste by SITA Drivers** | | |
| 32. | Asbestos waste must only be collected in roll-on/roll-off (RORO) or crane lift bins.<br>RORO bins are the preferred method of collection. | Site Manager |
| 33. | All asbestos waste must be transported in a covered, leak proof vehicle. | Site Manager |
| 34. | Appropriate PPE must be worn at all times when outside of the vehicle collecting / transporting Asbestos (refer to points 10-16 of this procedure) | Driver |
| 35. | Prior to handling the waste, confirm with the customer that all waste containing asbestos is packaged and labelled appropriately (see points 23-28 of this procedure) | Driver |
| 36. | Visually inspect the load prior to handling, checking that all waste is correctly packaged, contained and sealed.<br>If the load does not meet requirements, contact despatch to arrange for the customer to package correctly. | Driver |
| 37. | Load the waste in such a manner as to prevent damaging the packaging and the generation of dust or the stirring up of dust | Driver |
| 38. | Once all waste is loaded, bins must be tarped prior to transport. | Driver |
| 39. | Upon arrival at the disposal site, inform the weighbridge that the waste contains asbestos and follow all directions of site personnel.<br>Keep in contact with site personnel through the use of two-way radio at all times | Driver |
| 40. | Prior to arriving at the tipping face, close the trucks windows and select internal air circulation. These controls must be maintained until the truck leaves the landfill. | Driver |
| 41. | Wear appropriate PPE and respiratory protection equipment **at all times** when outside of the vehicle. | Driver |
| 42. | The waste must be unloaded and disposed of in such a manner as to prevent damaging the packaging and the generation of dust or the stirring up of dust. | Driver |
| 43. | Unload the waste in accordance with instructions from site personnel | Driver |
| 44. | Where required (in the event of leakage or break in packaging), the bin and the truck must be cleaned prior to leaving the premises in a designated wash bay. | Driver |

## 3. KEY ACTIONS – SITE REQUIREMENTS

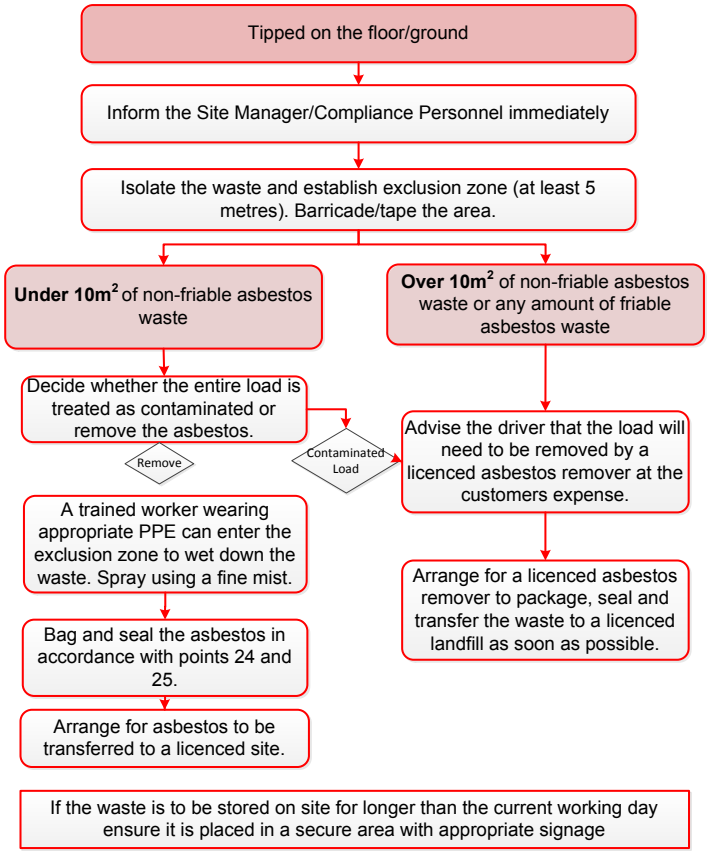
| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **Receipt of Asbestos waste at Licenced SITA sites** | | |
| 5. | Only SITA sites licenced to accept asbestos waste may do so. | Site Manager |
| 6. | Receipt and disposal of Asbestos on site must be managed in accordance with the site specific *Asbestos Waste Work Instruction* | Site Manager |
| 7. | Where required state specific documentation must be completed | Site Manager |
| 8. | Any load which does not meet the requirements for packaging or labelling should be rejected and the required regulatory forms and notifications completed.<br><br>Where appropriate site controls are in place, asbestos waste packages which have been slightly damaged during transportation may still be disposed of at the discretion of the site. | Weighbridge Operator / Site Manager |
| 9. | Contractors and members of the public must confirm that they have appropriate PPE to unload the asbestos waste on site. If they do not have all appropriate PPE, SITA may provide at the sites discretion<br>Where the customer does not have the required PPE the regulatory authority must be notified | Weighbridge Operator |
| 10. | Enter load information in the weighbridge system and advise workers at tipping face of arrival of asbestos containing waste immediately and when approved direct customer/driver to tipping location. | Weighbridge Operator |
| 11. | **At landfill sites -** Asbestos waste should be in roll-on/roll-off, crane lift bins or manually unloaded (e.g. from trailers), only licenced contractors are permitted to unload from tip trucks (I.e. for large loads of contaminated soil).<br><br>Unloading from marell bins in not permitted. | Operator |
| 12. | **At Licenced Transfer Stations –** direct small vehicle to the designated area to dispose of packaged asbestos waste in dedicated asbestos bins only. Refer to the Site *Asbestos Waste* Work Instruction for further details. | Weighbridge Operator |
| **Disposal of Asbestos Waste on SITA Licenced Landfill sites** | | |
| 45. | Handling and Disposal of Asbestos waste on site must be undertaken in accordance with the site specific *Asbestos Waste Work Instruction (WI063)* | Site Manager |
| 46. | When unloading and disposing of asbestos waste, the waste must be handled in such a manner as to prevent damaging the packaging and the generation of dust or the stirring up of dust. | Operator |
| 47. | Establish an 'exclusion zone' when asbestos waste is being unloaded | Operator |
| 48. | An excavator or front end loader should be used to handle the asbestos waste.<br>Unloading of asbestos waste must be made as close as possible to the active tipping face to avoid unnecessary handling of the materials and reduce the potential of packaging breaking. | Operator |
| 49. | Asbestos waste must not be pushed to avoid damaging any packaging. In exceptional circumstances asbestos waste may need to be pushed, pushing of asbestos waste must be undertaken in accordance with the requirements of the site specific *Asbestos Waste Work Instruction* | Operator |
| 50. | Only one asbestos waste load may be unloaded at a time, and only trained personnel may take part. All other persons must remain outside an identified 'exclusion zone' | Operator |
| 51. | Asbestos waste should be wetted prior to tipping to minimise the risks of airborne contaminants | Operator |
| 52. | Asbestos waste must not be re-used or recycled. | Operator |

| | | |
|---|---|---|
| 53. | Asbestos waste must never be compacted or come into direct contact with any earthmoving equipment. | Operator |
| 54. | After burial, asbestos waste must remain undisturbed within the landfill refer to the site *Asbestos Waste Work Instruction* for burial depth requirements | Site Manager |
| 55. | All disposal sites must keep a written record of the location, quantity and type of asbestos that is buried. | Site Manager |
| **Escape of Asbestos Waste During handling / unloading (Asbestos Spill)** | | |
| 56. | In the event of an escape of asbestos waste:<br>• Clear the area of all workers, visitors and vehicles immediately<br>• Notify the Site Manager and Compliance Personnel (where applicable)<br>• Ensure only appropriately trained workers manage the spill and appropriate PPE is worn at all times<br>• Wet the asbestos using a fine mist to control dust | Workers<br>Site Manager |
| 57. | Do not move or push the asbestos waste with plant or equipment | Operator |
| 58. | At landfill sites - cover the asbestos waste with a minimum 200 mm of clean soil or low level contaminated soil prior to any further waste being deposited on the area. Ensure this area is not compacted or comes into direct contact with any earthmoving equipment.<br><br>At transfer stations – Small amounts (under $10m^2$ of non-friable asbestos) may be wetted and repackaged and placed back in the designated asbestos bin by a trained worker. For over $10m^2$ of non-friable asbestos or any amount of friable asbestos, a licenced asbestos remover must be engaged to handle the waste. | Operator |
| 59. | An Incident Alert and CAR must be completed in SIMS in accordance with the requirements of the *Incident Reporting and Corrective Action Procedure*. | Site Manager / Compliance Personnel |
| **Detection of Asbestos Waste at Non-Licenced Sites** | | |
| 60. | Asbestos waste management at sites not licenced to accept asbestos waste must be managed in accordance with the site specific *Asbestos Waste Work Instruction* where available. All other sites must follow the steps below: | Site Manager |
| 61. | Prior to acceptance of the load check with the customer/driver to see if the load contains asbestos. | Weighbridge Operator |
| 62. | If asbestos is identified at the weighbridge, inform the customer that the load cannot be accepted. The driver must leave the site immediately – without unloading. | Weighbridge Operator |
| 63. | Inform the Site Manager/Compliance Personnel as soon as possible. | Weighbridge Operator |
| 64. | Where asbestos is identified after a vehicle has unloaded, always attempt to identify the customer for removal of the asbestos waste. Where the customer cannot be identified follow the process as detailed below: | Operator |

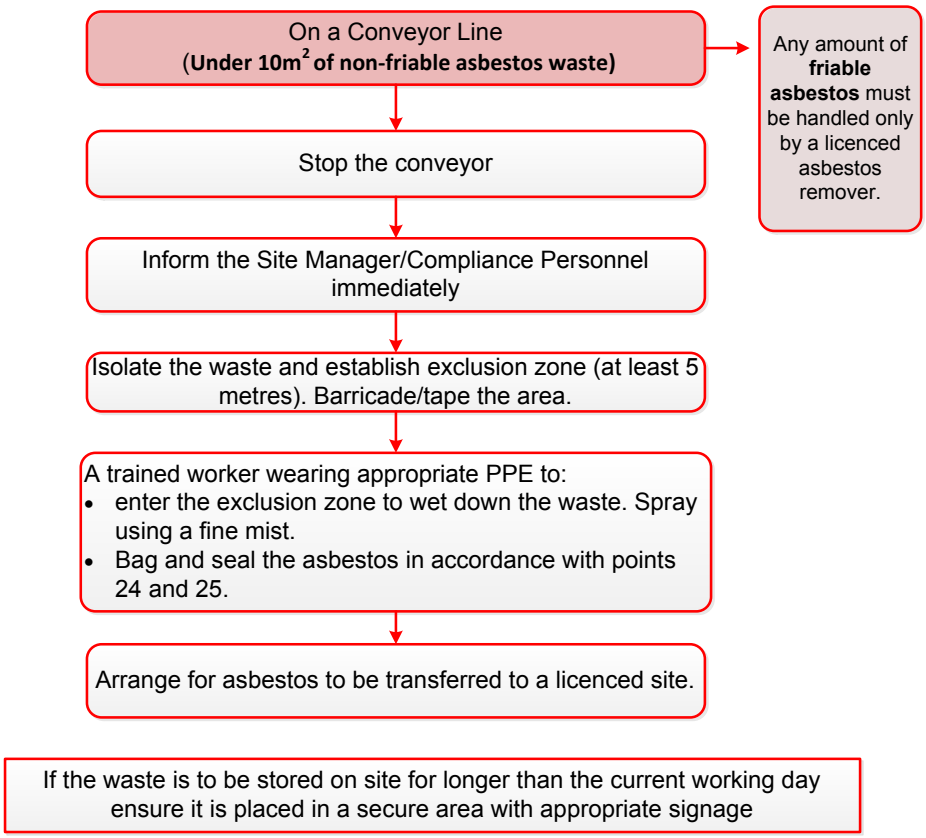
## 63.1 Asbestos identified at a Non-Licenced Mixed Waste Disposal Site (Landfill or Transfer Station)




## 63.2 Asbestos identified at Resource Recovery Site when tipped on the floor (Organics Composting, MRFs, ARRTs)



**63.3 Asbestos identified at Resource Recovery Sites – On a conveyor line - (Composting, MRFs, ARRTs)**




| | | |
|---|---|---|
| **At no time are SITA trained operators to handle any friable asbestos or non-friable asbestos over 10m².** | | Operator |
| **Suspect Loads** | | |
| 65. | Where a load is suspected to contain asbestos e.g. C&D materials in skip bins, small vehicles etc a visual inspection of the load may need to be undertaken. | Operator |
| 66. | Direct the load to a separate tipping area. A trained worker wearing appropriate PPE must spread the load out and inspect. The vehicle driver must remain with the vehicle. | Operator |
| 67. | Where asbestos is found, inform the site supervisor and follow the process in point 63.1 of this SOP. | Operator |
| 68. | Where required under site licence conditions complete any documentation required and inform the relevant state regulatory authority (e.g.: EPA, DER). | Weighbridge Operator |
| 69. | Clients who repeatedly violate the requirements of this procedure will be refused acceptance on a permanent basis. | Weighbridge Operator / Site Manager |
| **Response to Personal Asbestos Contamination** | | |
| 70. | If you have come in contact with asbestos dust at a disposal site while wearing all appropriate PPE you must:<br>• remove any visible asbestos residue with a damp cloth and place the rags into appropriate asbestos waste packaging and seal,<br>• remove PPE in the following order:<br>– overshoes,<br>– gloves,<br>– remove the disposable overalls by taking your arms out of the sleeves and rolling the overall sleeves inside out. Roll the overalls down your body, step out of them and place in the bag, | Worker |

| | | |
|---|---|---|
| | – remove the respirator last. If the filters have been contaminated remove and dispose of them<br>• decontaminate the outside of the bag using a damp cloth,<br>• seal the bag with duct tape, label as 'Asbestos Waste', and<br>• wash hands and face with soapy water, paying special attention to the fingernails, shower if preferred. | |
| 71. | If you have been in contact with asbestos dust without wearing appropriate PPE you must:<br>• be wetted down with a mist of water immediately where possible.<br>• walk to the nearest shower facility (Do not drive as the vehicle may become contaminated with asbestos fibres),<br>• remove all contaminated clothing and place in sealed bags as described in item 15-16<br>• shower, paying special attention to the hands, fingernails, face and head, and<br>• change into clean clothing. | Worker |
| 72. | Any person assisting must wear a P2 dust mask at all times | Worker |
| **Monitoring** | | |
| 73. | Check that the correct procedure for the receipt and handling of asbestos waste loads is followed as per the Monthly Monitoring Checklist (where applicable) | Site Manager |

## 4. KEY ACTIONS – ASBESTOS IDENTIFICATION & MANAGEMENT ON SITA SITES

| ITEM | ACTION | RESPONSIBILITY |
|---|---|---|
| **Asbestos Identification on SITA sites** | | |
| 74. | All SITA sites must ensure that any asbestos or ACM which is present on site (within site buildings) is identified by a competent person | Site Manager |
| 75. | Things to consider when identifying asbestos in buildings:<br>• When the building was constructed (year)<br>• Any refurbishments/additions to buildings and the date completed<br>• Types of materials used to construct the buildings | Site Manager |
| 76. | If asbestos or ACM is identified at a site, it must be clearly indicated with a label and warning sign | Site Manager |
| 77. | For all sites where asbestos or ACM has been identified as present within a building, an asbestos register must be developed. | Site Manager |
| 78. | The asbestos register must list all identified asbestos/ACM in buildings with the following information:<br>• The date on which it was identified<br>• Location, type and condition of the asbestos<br><br>It may also include:<br>• Details of any assumed asbestos in the workplace<br>• Results of analysis confirming material is not asbestos<br>• Dates when identification is carried out<br>• Details of any inaccessible areas of the building/s | Site Manager |
| 79. | The asbestos register must be reviewed at least once every 5 years to visually check the condition of identified asbestos | Site Manager |
| 80. | For all sites where asbestos or ACM has been identified as present within a building, an asbestos management plan must be developed | Site Manager |
| 81. | The asbestos management plan must include:<br>• Link to the asbestos register and location of signs and labels<br>• Procedures for managing the identified asbestos (e.g. SOP's, WI's)<br>• Procedures for incident reporting and emergency management<br>• Training requirements for workers carrying out work involving the identified asbestos | Site Manager |
| 82. | The asbestos management plan must be reviewed at least once every 5 years or when:<br>• A review of the asbestos register occurs<br>• Asbestos is removed, disturbed or enclosed/sealed at the workplace<br>• Identified controls are deemed inadequate | Site Manager |
| 83. | The asbestos register and asbestos management plan must be made accessible to all workers where requested | Site Manager |
| 84. | For further information refer to the *How to Manage and Control Asbestos in the Workplace* Code of Practice from Safe Work Australia | |

## DEFINITIONS

**Asbestos:** A generic term for the different varieties of mineral silicates belonging to the serpentine or amphibole groups of rock forming minerals, including actinolite asbestos, grunerite (or amosite) asbestos (brown), anthophyllite asbestos, chrysotile asbestos (white), crocidolite asbestos (blue) and tremolite asbestos or a mixture of any of these. Asbestos related diseases can have delayed symptoms of up to 20 to 40 years, from the first exposure to the substance. Such diseases can include: asbestosis, lung cancer and mesothelioma.

**Competent Person:** A person who has acquired the knowledge and skill to carry out any task, through training, qualification or experience, or a combination.

**Friable Asbestos:** Any material that contains asbestos and is in the form of a powder or can be crumbled, pulverised or reduced to powder by hand pressure when dry.

**Non-Friable Asbestos:** Any material that contains asbestos and is **not** friable (i.e. in the form of powder, crumbled, etc.). Also known as bonded asbestos

## RELATED DOCUMENTS

Asbestos Waste Management Work Instructions (site specific) WI063
EPA Publication IWRG611.1 – Industrial Waste Resource Guideline: Asbestos Transport and Disposal
Health Surveillance Procedure PROC015
Incident Reporting and Corrective Action Procedure PROC008
Record of asbestos burial location, quantity and type (site specific)
Safe Work Australia –Code of Practice – How to Manage and Control Asbestos in the Workplace
Safe Work Australia –Code of Practice – How to Safely Remove Asbestos
Waste Rejection Form (site specific)
Work Health and Safety Regulations 2011 – Chapter 8: Asbestos

## REVIEW AND DOCUMENT CONTROL

| VERSION | CHANGE | REVIEWED | AUTHORISED | DATE |
|---|---|---|---|---|
| 11 | New template and full review in line with the SWA Codes of Practice and relevant state EPA requirements<br>Previous appendices relating to procedures at individual sites converted into work instructions.<br>Name changed to Asbestos Waste | TL Safety Systems<br>EQS Managers<br>Int. Systems Manager | GM EQS | 30/11/14 |
| | | | | |
| | | | | |

# APPENDIX

Examples of Materials that Contain Asbestos

**A**

Air-conditioning ducts: exterior or interior acoustic and thermal insulation
Arc shields in lift motor rooms or large electrical cabinets
Asbestos-based plastics products - as electrical insulates and acid-resistant compositions or aircraft seat
Asbestos ceiling tiles
Asbestos cement conduit
Asbestos cement electrical fuse boards
Asbestos cement external roofs and walls
Asbestos Cement in the use of form work when pouring concrete
Asbestos cement internal flues and downpipes
Asbestos cement moulded products such as gutters, ridge cappings, gas meter covers, cable troughs and covers
Asbestos cement pieces for packing spaces between floor joists and piers
Asbestos cement (underground) pits, as used for traffic control wiring, telecommunications cabling, etc
Asbestos cement render, plaster, mortar and coursework
Asbestos cement sheet
Asbestos cement sheet behind ceramic tiles
Asbestos cement sheet internal over exhaust canopies such as ovens, fume cupboards, etc.
Asbestos cement sheet internal walls and ceilings
Asbestos cement sheet underlays for vinyl
Asbestos cement storm drain pipes
Asbestos cement water pipes (usually underground)
Asbestos-containing laminates (e.g. formica) used where heat resistance is required, e.g. ships
Asbestos-containing pegboard
Asbestos felts
Asbestos marine board, e.g. marinate
Asbestos mattresses used for covering hot equipment in power stations
Asbestos paper used variously for insulation, filtering and production of fire resistant laminates
Asbestos roof tiles
Asbestos textiles
Asbestos textile gussets in air-conditioning ducting systems
Asbestos yarn
Autoclave / steriliser insulation

**B**

Bitumen-based water proofing such as malthoid, typically on roofs and floors but also in brickwork
Bituminous adhesives and sealants
Boiler gaskets
Boiler insulation, slabs and wet mix
Brake disc pads
Brake linings

**C**

Cable penetration insulation bags (typically Telecom)
Calorifier insulation
Car body filters (not common)
Caulking compounds, sealant and adhesives
Cement render
Chrysotile wicks in kerosene heaters
Clutch faces
Compressed asbestos cement panels for flooring, typically verandas, bathrooms and steps for demountable buildings
Compressed asbestos fibres (CAF) used in brakes and gaskets for plant and automobiles

**D**

Door seals on ovens

**E**

Electric heat banks - block insulation
Electric hot water services - normally not asbestos but some millboard could be present
Electric light fittings, high wattage, insulation around fitting (and bituminised)
Electrical switchboards – see Pitch-based
Exhausts on vehicles

**F**

Filler in acetylene gas cylinders
Filters - beverage; wine filtration
Fire blankets
Fire curtains
Fire door insulation
Fire-rated wall rendering containing asbestos with mortar
Fire-resistant plaster board, typically on ships
Fire-retardant material on steel work supporting reactors on columns in refineries in the chemical industry
Flexible hoses
Floor vinyl sheets
Floor vinyl tiles
Fuse blankets and ceramic fuses in switchboards

**G**

GalbestosTM roofing materials (decorative coating on metal roof for sound proofing)
Gaskets - chemicals, refineries
Gaskets - general
Gauze mats in laboratories / chemical refineries
Gloves - asbestos

**H**

Hairdryers - insulation around heating elements
Header (manifold) insulation

**I**

Insulation blocks
Insulation in electric reheat units for air-conditioner systems

**L**
Laboratory bench tops
Laboratory fume cupboard panels
Laboratory ovens - wall insulation
Lagged exhaust pipes on emergency power generators
Lagging in penetrations in fireproof walls
Lifts shafts - asbestos cement panels lining the shaft at the opening of each floor, and asbestos packing around penetrations
Limpet asbestos spray insulation
Locomotives - steam; lagging on boilers, steam lines, steam dome and gaskets

**M**
Mastics
Millboard between heating unit and wall
Millboard lining of switches
Mortar

**P**
Packing materials for gauges, valves, etc., can be square packing, rope or loose fibre
Packing material on window anchorage points in high rise buildings
Paint, typically industrial epoxy paints
Penetrations through concrete slabs in high rise buildings
Pipe insulation including moulded sections, water-mix type, rope braid and sheet
Pitch-based (e.g. zelemite, ausbestos, lebah) electrical switchboard
Plaster and plaster cornice adhesives

**R**
Refractory linings
Refractory tiles
Rubber articles - extent of usage unknown

**S**
Sealant between floor slab and wall, usually in boiler rooms, risers or lift shafts
Sealant or mastik on windows
Sealants and mastics in airconditioning ducting joints
Spackle or plasterboard wall jointing compounds
Sprayed insulation - acoustic wall and ceiling
Sprayed insulation - beams and ceiling slabs
Sprayed insulation - fire retardant sprayed on nut internally, for bolts holding external building wall panels
Stoves - old domestic type; wall insulation

**T**
Tape and rope - lagging and jointing
Tapered ends of pipe lagging, where lagging is not necessarily asbestos
Tilux sheeting in place of ceramic tiles in bathrooms
Trailing cable under lift cabins
Trains - country - guards vans - millboard between heater and wall
Trains - Harris cars - sprayed asbestos between steel shell and laminex

**V**
Valve, pump, etc. insulation
Welding rods

***Reprinted from the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)]***

# ATTACHMENT C2

## Waste Acceptance Management Plan

MAN009

# WASTE ACCEPTANCE MANUAL

Allawuna

VERSION 1

July 2015



THE LEADER IN RESOURCE RECOVERY

# Table of Contents

## 1. Purpose

This manual must be read carefully by all Suez Environnement (Suez) employees involved in the acceptance and processing of waste at the Allawuna Landfill. The intention of this manual is for use as a reference for the day to day operations concerning waste acceptance and processing.

This manual outlines the procedures for waste acceptance of general waste and construction and industrial waste streams. The manual, in conjunction with a state work instruction, documents the procedures for responding to potential asbestos contamination in waste as is required by the Department of Environment and Regulation (DER). Procedures have been developed to ensure;

- the safe acceptance of waste to site,
- to manage the risk of asbestos contamination,
- reduce the risks of asbestos contamination, and
- reduce the risk to workers and the community.

## 2. Emergencies

The *Emergency Response Plan (PLANS003)* must be followed for all emergency situations. There are also emergency information sheets around the site that provide site details, first aiders and emergency contact details. (Emergency Plan and associated documents to be developed once site further progressed).

## 3. Records

All records related to this manual must be maintained and available on site for internal/external audits and inspections. Records can include, but not be limited to;

- Waste accepted,
- Waste rejected,
- Contaminated loads,
- Incident Records (including odour complaints),
- Maintenance records, and
- Training records.

## 4. Opening Hours:

| | |
|---|---|
| Weekdays | TBC |
| Weekends | TBC |
| Public Holidays | TBC |

CLOSED:
Christmas Day
New Year's Day
Good Friday

## 5. Contact Details

Contact: TBC
Title:
Phone:
Mobile:

## 6. Safety Rules and Site Requirements

Note: Site safety Rules and requirements to be developed once site is further progressed.
All customers, visitors and contractors must adhere to, and sign off on, the site safety rules.
Appropriate PPE must be worn at all times (Drivers must wear high visibility vests and steel capped boots).
Follow directions from the staff at all times.
Follow safety signage whilst on site.
A full copy of the site safety rules to be available at the weighbridge.

## 7. Site Operational Responsibilities

Weighbridge Operators Responsibilities

- Assess waste upon entry
- Reject inappropriate waste streams
- Provide customer with a receipt
- Maintain all documentation and systems used on site
- Induct new staff
- Ensure all operations undertaken on site are conducted in accordance with Suez policies, procedures and legal requirements
- Report any non-conformances, hazards or incidents to their supervisor or manager

Tip face Receivals Staff Responsibilities

- Assess waste and direct customer to appropriate unloading area
- Ensure all operations undertaken are conducted in accordance with Suez policies, procedures and legal requirements
- Report any non-conformances, hazards or incidents to their supervisor or manager
- Manage any hazards on site to maintain a safe work place
- Identify any hazardous loads (including asbestos) that need to be reloaded and/or rejected

Worker Responsibilities (Plant operators and labourer)

- Ensure all operations, including plant and equipment operation, are conducted in accordance with Suez policies, procedures and legal requirements
- Identify any hazardous loads (including asbestos) that need to be reloaded and/or rejected
- Report any non-conformances, hazards or incidents to their supervisor or manager
- Manage any hazards on site to maintain a safe work place

## 8. Training

All workers on site must be trained in accordance with *PROC002 Training, Induction and Competency*. All staff working at this facility must also undergo external training for the identification and handling of asbestos. They are required to clearly understand;

a) The health hazards associated with asbestos;
b) The controls used to minimise exposure to asbestos dust and how to use personal protective equipment;
c) How to visually inspect waste;
d) How to recognise different types of asbestos and asbestos containing materials;
e) Training in site based procedures relevant to their role such as processes for rejecting loads, classifying loads, unloading and inspecting low and high risk loads, segregating and storing asbestos and asbestos containing materials; and
f) Awareness of environmental and asbestos related legislation relevant to the premises and the conditions of the license that relate to the tasks that the person performs on the site.

## 9. Acceptance Procedures

### *9.1 General*

This manual has been developed on the premise that it will be licenced as a Category 64: Class II or Class III putrescible landfill site. In accordance with the DER this manual has been developed and includes procedures for both the acceptance and unintended acceptance of asbestos. Relevant procedures include;

- This manual contains the training requirements for staff.
- The *Asbestos Waste* SOP outlines key principles for the management of asbestos waste in particular the safe handling, transport and disposal.
- The *Asbestos Waste Management – Western Australia* work instruction outlines the identification techniques for general and C&D waste and the isolation and containment of any identified asbestos.

### *9.2 Waste Accepted at the Facility*

Customers coming to site are account only. The site is not open to public. Price list is distributed annually and modified as required.

- Clean Fill
- Inert Wastes type 1
- Inert wastes type 2
- Putrescible Wastes
- Special Waste Type 1
- Special Wastes Type 2; and
- Other wastes that comply with Class II criteria in the document titled '*Landfill Waste Classification and Waste Definitions*' 1996.

#### 9.2.1 Clean Fill

Material that will have no harmful effects on the environment and which consists of rocks or soil arising from the excavation of undisturbed (virgin) material;

Clean Fill is defined as "material that will have no harmful effects on the environment and which consists of rocks or soil arising from the excavation of undisturbed (virgin) material."

Clean fill materials accepted at Allawuna Farm Landfill include:

- Clay
- Sand
- Top Soil
- Gravel
- Rock

Clean fill can also include virgin material mixed with waste that has been excavated from areas that are not contaminated or do not contain sulphuric ores or soils. Contamination can result from industrial, commercial, mining or agricultural activities or by use of manufactured chemicals. If determined not to be clean fill refer to section 8 contaminated soil assessment.

#### 9.2.2 Inert Wastes Type 1

Includes wastes that are largely non-biodegradable, non-flammable and not chemically reactive. Examples include building and demolition waste, asphalt waste, casting sand, blasting sand or garnet and biosolids categorised for unrestricted use. The following criteria must be achieved and demonstrated for drum acceptance and disposal at Allawuna Farm Landfill:

- The previous contents of the drums must be advised.
- Drums must be emptied and cleaned using an approved method.
- Drums must be open-headed or have the bungs removed.

- Drums must either be crushed flat or perforated.

Please Note:
The cleaning method should be as good as or better than the triple-rinsing method developed by AVCARE. The Landfill Manager must approve the cleaning method.

Perforations must be 20mm by 20mm and there must be a minimum of 4 perforations per drum. Two (2) perforations are to be within 100mm of the drum base and two others located at different heights from the base on opposite sides of the drum.

9.2.3 Inert Wastes Type 2

Wastes consisting of non-biodegradable organic materials such as tyres and plastics, which are potentially flammable and require special management to reduce the potential for fires; Suez acknowledges that recycling is the preferred option over disposal for tyres. Suez is licensed to accept small quantities of tyres customers are advised that tyres should be recycled.

## Acceptance of Tyres

- Tyres are a controlled waste under the *Environmental Protection (Controlled Waste) Regulations 2004*.
- An exemption from the regulations applies for loads less than 20 tyres.
- Loads in excess of 20 tyres must be transported to site by a Controlled Waste Licensed Carrier and driver must have a Controlled Waste Tracking Form.
- A maximum stockpile of up to 100 tyres can be maintained on site for recycling with Management Approval only.

**Burial of Tyres – Tyres not accepted anymore**

- Shredded or whole tyres can be accepted for burial. Batches of tyres for burial cannot exceed 40 cubic meters.
- Prior arrangement is to be made with the Landfill Manager to ensure that a suitable location in the active cell is available (24 hours' notice is required).
- Tyres cannot be buried within 5 meters of the edge of the landfill and where possible should be land filled in the centre of the active cell.
- Tyres must be covered with a minimum of 1 meter of putrescible waste as soon as practicable after waste placement.
- A GPS reading is to be recorded for each tyre burial and recorded on the Landfill Locations Spreadsheet.

9.2.4 Putrescible Wastes

Wastes that contain organic materials such as food wastes or wastes of animal or vegetable origin, which readily bio-degrade within the environment of a landfill. Examples include, municipal waste, food waste, paper and plastic office waste and sewage treatment plant grit and screenings.

Putrescible waste is the component of the waste stream likely to be become putrid including wastes that contain organic materials such as food wastes or wastes of animal or vegetable origin, which readily bio-degrade within the environment of the landfill.

Allawuna Farm Landfill is licensed to accept all putrescible wastes as long as they are not mixed with other wastes, which fall outside of the acceptance criteria.

Examples of putrescible wastes include municipal waste such as;

- Household kerb-side collection waste,
- Other domestic wastes such as furniture, domestic clean-ups, residential garden waste or grass sods
- Local council waste such as street sweeping, litter bins and parks, and
- Commercial waste from food preparation premises or supermarkets.
- Food waste,
- Bio solids other than those categorised for unrestricted use,
- Sewage treatment plant grits and screenings,
- Animal manures and carcasses,
- Office and packaging wastes that are not mixed with any other type of waste (e.g. paper, cardboard, plastics, wood),
- Cleaned pesticide, biocide, herbicide or fungicide containers (refer to Type 1 Inert Wastes – Drum Disposal for acceptance conditions),
- Drained and mechanically crushed oil filters, rags and oil absorbent materials (not containing free liquids) from automotive workshops,
- Disposable nappies, incontinence pads and sanitary napkins (not otherwise classified as biomedical wastes due to the presence of infectious material),
- Vegetative waste generated from commercial, public and residential sources, agriculture or horticulture, and
- Non-chemical waste generated from manufacturing and services (including timber, paper, plastics, thermosets and composites).

### 9.2.5 Special Waste Type 1

The acceptance of asbestos waste on site shall be undertaken in accordance with this Manual and SOP029: Asbestos Waste and WI063 Asbestos Waste Management.

SOP029 Asbestos Waste outlines the key principles for safe handling, transport and disposal of asbestos waste. WI063 Asbestos Waste Management Outlines the specific procedure to be followed at individual sites and discusses the specific disposal requirements or the procedure for identifying and contained asbestos found in waste streams. A site specific one would have to be provided for Allawuna, in the interim 63.4 and 63.7 would be sufficient to show expected procedures.

### 9.2.6 Special Wastes Type 2

The *Code of Practice for the Management of Clinical and Related Wastes 1999*, determines two types of clinical wastes as suitable for disposal to landfill;

- Clinical Waste for Supervised Landfill
- Waste Suitable for General Landfill Disposal

**Clinical Waste for Supervised Landfill**

The supervised burial waste stream may include waste materials such as:

- Lightly to moderately contaminated dressings (no saturated dressings),
- Intravenous bags and related equipment (with sharps removed),
- Emptied saline bags,
- Colostomy bags,
- Used drug containers (emptied and washed vials, bottles, etc), and;
- Sterilised diagnostic specimens, including cultures from pathology laboratories. In activation of pathology samples must be carried out using an autoclaving, shredding and microwaving process, approved by the DER.

Note: Bulk body fluids (e.g.: Fluids in disposable suction canisters) are not to be accepted for disposal, unless treated with a solidifying or disinfecting agent and approved by the DER, which effectively renders the material unrecognisable as a body fluid produced in a medical procedure.

Clinical wastes, described above, when evenly distributed through a waste load is acceptable as general mixed waste as long as it does not exceed 10% of the total load and there are no pockets of clinical waste in the load. If there are concentrated pockets in the load, the whole load is then considered to be a clinical waste.

Wastes from operating theatres, delivery rooms and emergency or severe trauma treatment areas cannot be disposed to landfill due to the high probability of heavy contamination. This material must be incinerated.

Any wastes containing patient identity must be maintained by supervised burial.

**Waste Suitable for General Landfill Disposal**

Waste suitable for General Landfill Disposal

- Kitchen waste or general putrescible waste that is uncontaminated with clinical waste may be disposed as general mixed waste.
- Very low (less than 10% at generation point) concentrations of contamination of the following wastes:
- Contaminated dressings,
- Intravenous bags and equipment (with sharps removed),
- Saline bags, and
- Colostomy bags.

Note: Not including treated pathology samples, unless they have been effectively sterilised and denatured to render them unrecognisable as clinical waste.

Incontinence pads and disposable nappies are acceptable as a general mixed waste.

**Disposal Procedure**

The following procedure shall be followed for the disposal of biomedical waste:

- 24 hours' notice is required for a clinical waste burial to allow preparation and ensure equipment availability
- Deliveries require GPS reading of the burial location. This is recorded on the Clinical Waste Disposal Register and site plan.

- Loads of clinical waste must be immediately covered to be at a minimum depth of one metre of soil or solid waste.

  A company employee must be present at each clinical waste burial and sign the Clinical Waste Disposal Register to attest that it has been carried out in accordance with the licence conditions

### *9.3 Waste not accepted*

- Dangerous or hazardous wastes (i.e.: liquid wastes, flammable wastes, toxic wastes, corrosive wastes, carcinogenic wastes, poisons, infectious wastes, radioactive wastes)
- Quarantine wastes

### *9.4 Inspection of loads*

All incoming waste streams must be inspected to ensure that the waste can be accepted at site. All loads must be visually inspected when arriving/unloading at site. This can be done for some wastes at the weighbridge using the surveillance camera (camera system at site to be determined); others can be

inspected after tipping. If wastes are not permitted by licence and/or asbestos is visually identified in load it shall be contained, appropriately handled and disposed of.

### *9.5 Rejection of Loads*

In the event that a customer has unacceptable waste and the load needs to be rejected, please take the following steps;

- inform the customer that the load has to be rejected,
- advise customer of suitable location to take the waste,
- advise the supervisor and manager of the rejected load, and
- complete Appendix A: Waste Rejection Form (Forward to manager and supervisor).

### *9.6 Contaminated Loads*

In the event that a customer has contaminated waste the load may be charged an extra fee or be asked to take the contamination away. Tyres and mattresses are either charged an extra fee or the customer is asked to remove this waste from site. Please see Appendix B for contaminated waste.

### *9.7 Dust/Odour Management*

Odour is managed onsite by not accepting particularly odorous waste and following correct waste handling and landfill cover (daily and intermediate) procedures.

Dust is controlled on site through road maintenance and the use of onsite water trucks.

## 10. Computers, Mandalay & Reporting

### *10.1 SUEZ Computer System*

For problems with SUEZ computers initially run the problem past the Site Manager and Supervisor. Contact SITA BTS via email helpdesk@sita.com.au to lodge problem. Alternatively SITA BTS can be contacted on (02) 8754 0188 (7am – 7pm EST).

### *10.2 Mandalay System*

For problems relating to Mandalay computers contact Mandalay help line on (07) 3010 7900 or support@mandalaytech.com.

Setting up a new user on the Mandalay system

- Turn on the J2 console by pressure power switch button underneath the right-hand side of the monitor. Log onto the J2 console using your Suez username and password.
- To open Ticketing;
- Double click on “ADMINISTRATION” Icon on the desktop.
- Enter your “User Name”, (User Casual, do not require passwords).
- Enter your “Password” and click ENTER.
- Click on the “users” tab and select “add” in the bottom left hand corner of the window.
- Add the new user entering user’s full name.
- Select apply when set-up is complete.

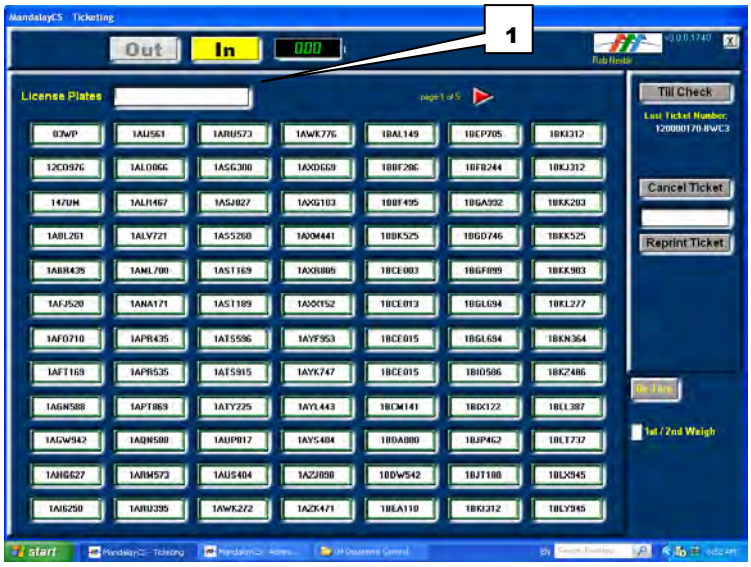
Logging onto the Mandalay system

- Turn on the J2 console by pressure power switch button underneath the right-hand side of the monitor. Log onto the J2 console using your Suez username and password.
- To open Ticketing;
- Double click on “TICKETING” Icon on the desktop
- Enter your “User Name”, (User Casual, do not require passwords)
- Enter your “Password” and click ENTER.

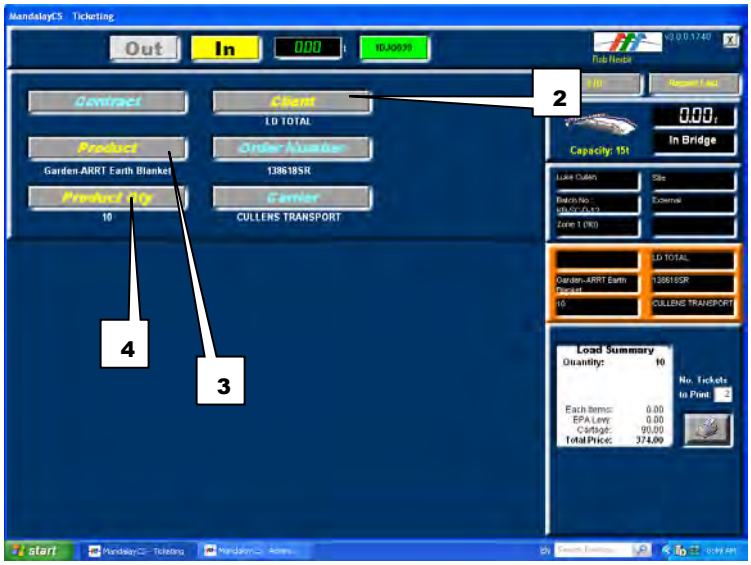
- Click “X” located on the top right of the screen of the ticketing and select “Minimise”
- Double click on “ADMINISTRATION” Icon on the desktop
- Enter your “User Name”,
- Enter your “Password”
- You can now switch between the two screens using “ALT” and “TAB”
- Remember to log off when ending your shift. Click NO if someone is taking over, ‘YES if no one is taking over from your shift.
- When you close ticketing down, it will ask you if you wish to end the ‘Till Shift’. Click ‘YES if no one is taking over from your shift or NO if someone is taking over.
- Note: If you are not the first person to log in to ‘TICKETING’ for the day, the computer will prompt you to close the till for the day and open a new one. Select “NO”, stay in the current till until the end of the day.

Processing of Waste Acceptance Transaction

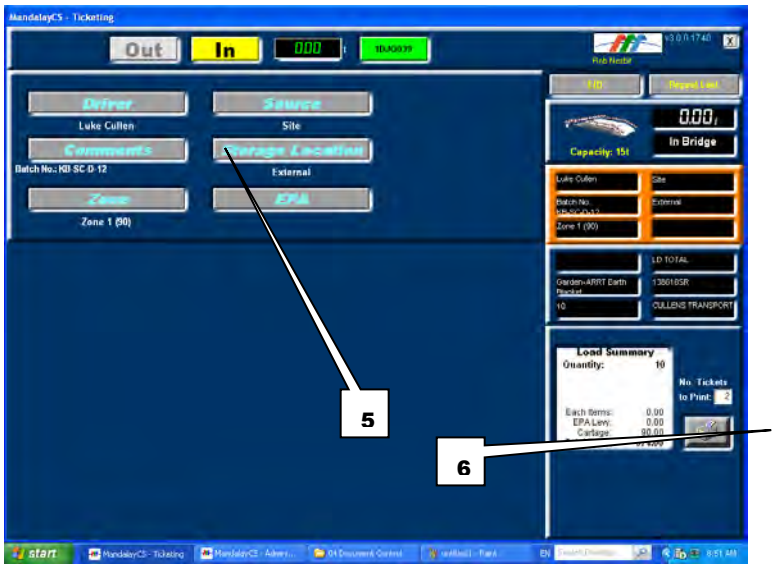
1. Type truck License Plates test box in Ticketing “In” screen as outlined below.




2. If the truck License Plate is not assigned to a Client, click on ‘Client’ and select correct client.
3. If not assigned to truck, click on “Product” and add product (waste) type.
4. If incoming waste is liquid, click on “Qty” and add type in the correct litres.




5. If waste is a Controlled Waste, click on second menu page (SHOWN BELOW) and enter associated TFN (Tracking Form Number) in the comments section. Note TFN must match the TFN on the Waste Tracking Form.
6. Print the ticket.




*Overloaded Vehicle*

Over loaded vehicles are considered to be greater that the Gross Vehicles Mass (GMV) stipulated in the Main roads guidance chart (Appendix D). The GVM of trucks or vehicles must be added when a vehicle is set up in the system. This will allow easy identification of overloaded vehicles.
In the event that a vehicle comes in / out overloaded, follow SOP042 - Overloaded Vehicles.

*Cancelling Tickets*

Tickets are to be cancelled when it has been identified that an error has occurred. Prior to cancelling a ticket, the replacement ticket must be entered into Mandalay so that when the required ticket is cancelled, the replacement ticket can be referenced. The reason for the cancellation of a ticket must be recorded on the Mandalay system as prompted. Likely reasons for the cancellation of a ticket are as follows:

- Wrong waste type selected
- Wrong Client charged
- No delivery fee charged
- Client could not tip

*Adding a New Vehicle*

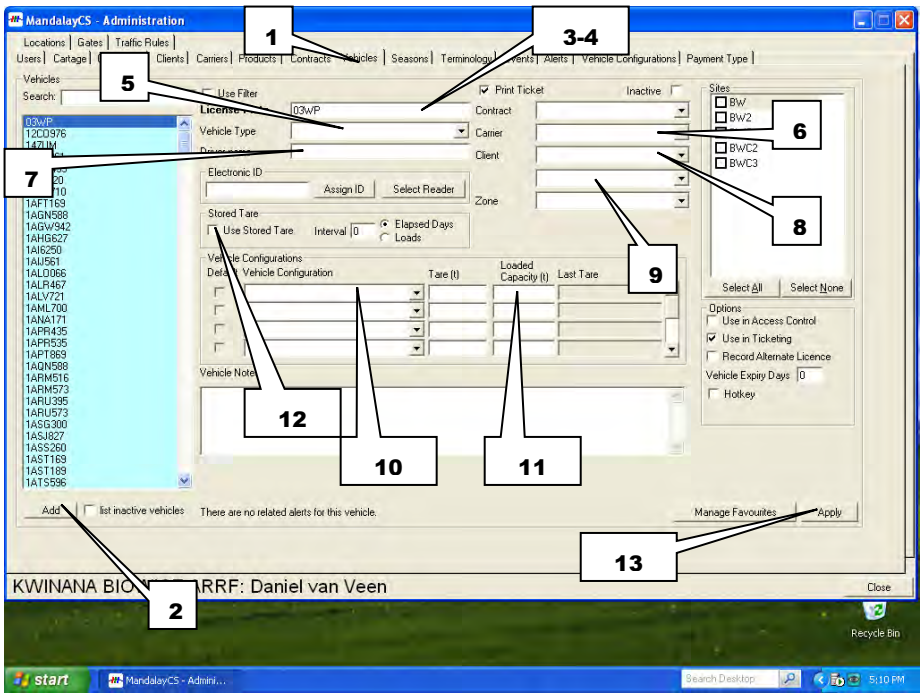
All truck tipping waste and transporting product must be entered onto the Mandalay system. When setting up a truck their GVM weight must be included on the system to allow identification of overloaded vehicles.

Follow the procedure below to add a new vehicle;

1. Open the 'Mandalay Administration' system. Click on the Vehicles tab. Note: If you need to alter the details of a truck that is already in the system, you can change it in this section.
2. Click 'Add'
3. Delete 'NEW00?'
4. Enter the 'Licence Plate' (Registration)
5. Enter the 'Vehicle Type' (e.g. Tandem).
6. Enter the 'Driver Name' (if known)
7. Enter 'Client' to be charged (if vehicle is associated with one client ONLY)
8. Enter the 'Waste Type' (if vehicle ONLY transports one waste type)
9. In the 'Vehicle Configuration' section you will need to select a vehicle type, if possible. Note: If it is a garbage truck you do not need to select a vehicle configuration (Refer Appendix 3).
10. Please enter the trucks GVM. This can be found on the current Main Roads Guidance Chart 'Mass Limits for Trucks in Western Australia' (Refer Appendix 3).

NOTE: The GVM is to be entered in tonnes.

11. If the vehicle does not change configuration or is not a Hook Lift truck, check the Stored Tare box and change the Interval to 30 days.
12. Click 'Apply'
13. Open 'Ticketing'. Click on 'OUT' and then 'IN'



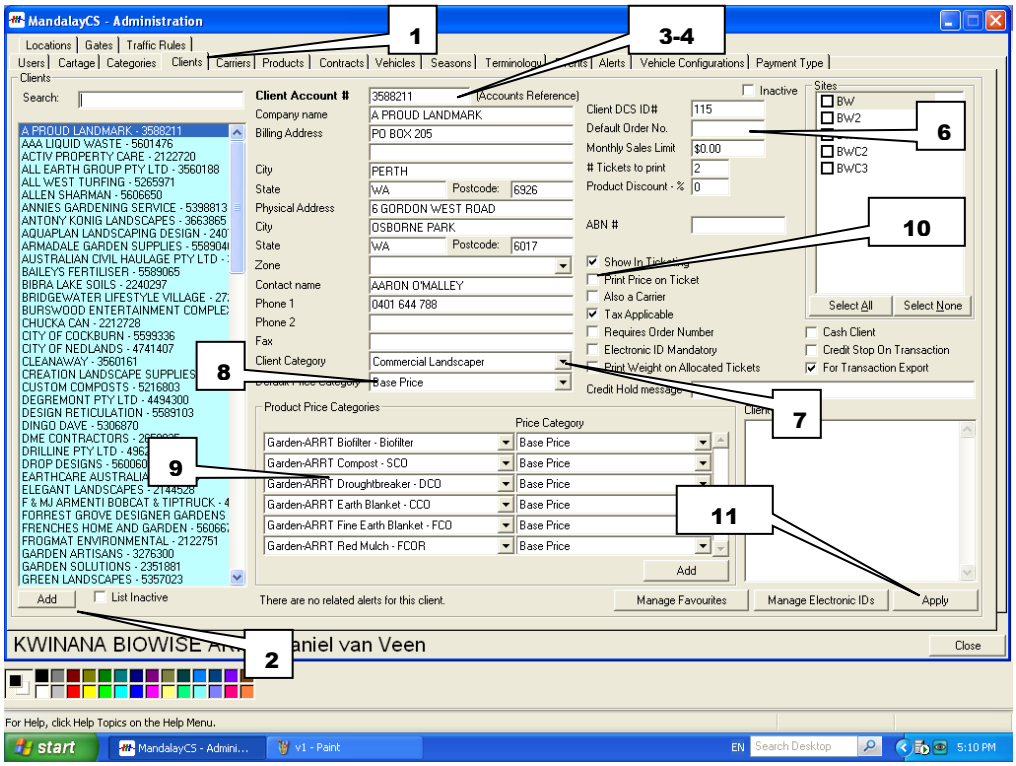
*Adding a New Client*

Open the 'Mandalay Administration' system.

1. Click on the Client tab. Note: If you need to alter the details of a truck that is already in the system, you can change it in this section.
2. Click 'Add'
3. Delete 'NEW00'
4. Add the Client Account #. NOTE: This must equal the Service Agreement No. of the client in JDE.
5. Enter in the Client details
6. If the client uses a default order number, enter the number into the field as shown below.
7. Of the client receives product, select the appropriate Client Category.
8. Select the default Price Category.
9. Select all Products for the client and the associated Price Category for each product.
10. Select the number of tickets to be printed for the Client and un-check box if Client does not wish to have the price printed on ticket.
11. Click 'Apply'

Open 'Ticketing'

Click on 'OUT' and then 'IN'

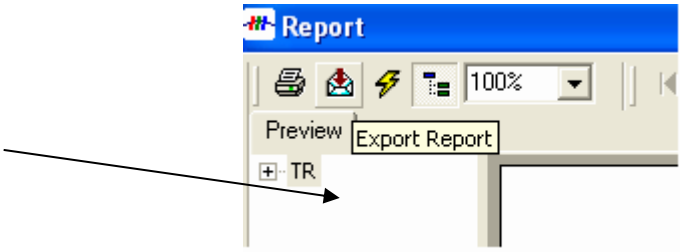



*Reporting*

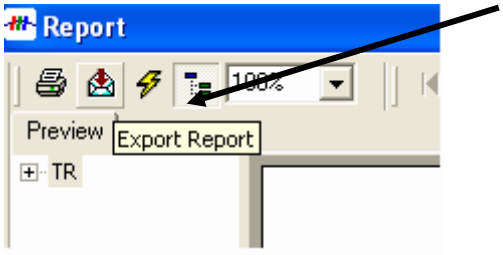
Steps for accessing Reporting

- Access the weighbridge computer
- Select "REPORTING"
- Enter username and password.

- Reports that need to be produced are listed below.
- Once you have previewed the report you need to save it as a MS Excel Spreadsheet to change a few things. Save this report in the B:\Mandalay\Reports.
- Click the envelope at the top left hand side on the screen.




- Once you have previewed the report you need to save it as a MS Excel Spreadsheet. Save this report in the B: \Mandalay\Reports, click the envelope at the top left hand side on the screen.




- Bring down the drop box under the Format and change it as a MS Excel 97-2000 and then click OK.
- It will bring up a box titled Excel Format Options. Don't change anything just click OK.
- Now you need to save this in the B:/Mandalay/Reports and name as appropriate.
- You also have the option to print reports as well.

*Monthly Reporting Requirements*

At the end of each month, the following reports must be run and sent to Landfill Manager, WA State Infrastructure accountant and WA Infrastructure Manager for end of month billing:

- Product delivery summary by category
- Client history
- Client deliveries by product category
- Cancelled tickets reason by cancellation date
- End of Month Extract (See below)
- Customer Reporting Requirements
- Sometimes clients ring up and request summaries or loads of what has been brought in on their account for a certain period. These reports are called 'Client Deliveries'. We must get them to request this information in writing via email.

End of Month Extract

- Double click on WM Extract Icon on Desktop
- Select a date range and click on Extract Range
- When it asks you 'Do you want to extract data that has already been extracted?' select "Yes"
- Once extract complete click Quit
- Send with the monthly reports

Customer Account Applications

- To set up a credit account:
- Landfill Manager is to decide initial Yes/No for the customer.

- Ask the customer to complete a SUEZ Application for Commercial Credit Account, SUEZ Customer Application Selection Form, Nominated Vehicle Form, and Terms and Conditions.
  Completed Forms go to the Infrastructure Administration Coordinator who then forwards them to the Accounts Office in Sydney.

| | | |
|---|---|---|
| | **Waste Rejection Form** | **APPENDIX 1** |

*Must be used for every rejected load of waste

| Customer Details | | | |
|---|---|---|---|
| Customer | | Account Number | |
| Waste Producer | | Waste Carrier | |
| Waste Carrier Registration | | | |
| **Delivery/Load Details** | | | |
| Waste Description | | | |
| Time of arrival | | Quantity | |
| Reason for Rejection | | | |
| | | | |
| | | | |

This delivery has been rejected for the above reasons by;

| | |
|---|---|
| Name | Title |
| Signature | Date |

| | | |
|---|---|---|
| | **Waste Contamination Form** | **APPENDIX 2** |

*Must be used for contaminated load of waste. Contaminated waste streams are those that are not accepted at site commonly this includes tyres, gas bottles and over size items. Contamination results in notification to the customer, an additional charge for contamination or a request for the waste to be removed from site.

| Customer Details | | | |
|---|---|---|---|
| Customer Name | | Account Number | |
| **Delivery/Load Details** | | | |
| Waste Description | | | |
| Time of arrival | | Quantity | |
| Contamination details (include photo where possible) | | | |
| | | | |
| Action Taken (one of the below);<br>Customer Notified of Contamination ☐<br>Contamination Charge ☐<br>Customer Requested to remove waste ☐ | | | |

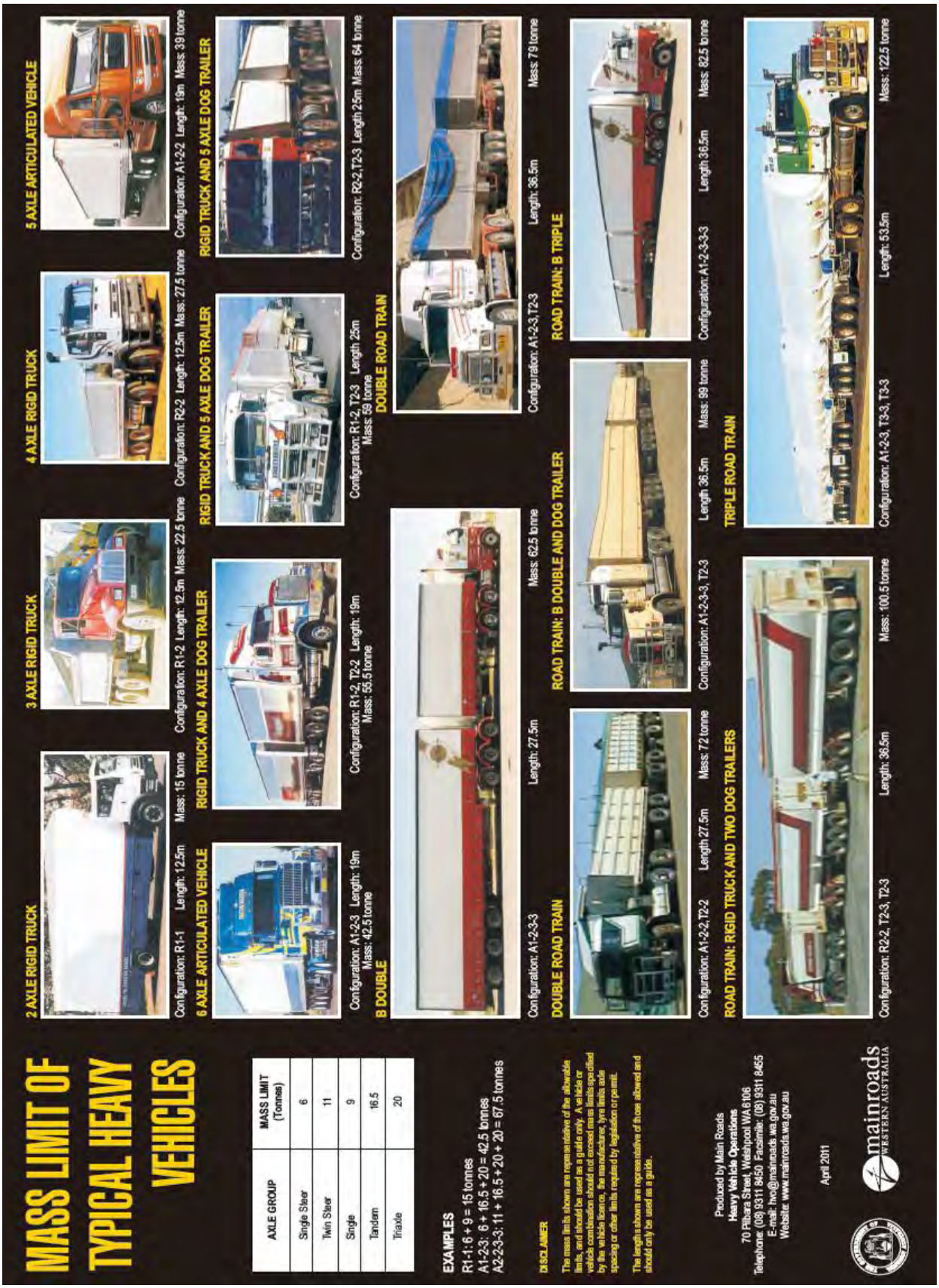
This delivery has been rejected or charged a contamination fee for the above reasons by;

| | |
|---|---|
| Name | Title |
| Signature | Date |

## Appendix 3: Facility Signage

TBC

## Appendix 4: Mass Limit of Typical Heavy Vehicles



## REVIEW AND DOCUMENT CONTROL

| VERSION | CHANGE | REVIEWED | AUTHORISED | DATE |
|---|---|---|---|---|
| 1 | Initial Issue | | | |
| 2 | | | | September 2012 |
| 3 | Updated formatting into new template and content in line with asbestos requirements for the DER. | EQ Co-Ordinator | TL Safety Systems | September 2014 |
| | | | | |

## ATTACHMENT D1

**Creek Crossing Correspondence**

Dear Mr Bowman,

The DoW's position is still that the application for the bed and banks permit will not be assessed until full approval for the development has been reached. Once the DER's concerns have been resolved, we will be in a position to assess your application regarding the 13 Mile Brook crossing.

We believe it is appropriate and prudent to take a holistic approach to the assessment of any development at the site. As such, we cannot issue the bed and banks permit until the DER is satisfied with the proposal and the development is clear to proceed.

Regards,

Brendan Imms

Natural Resource Management Officer

Department of Water - Swan Avon Region

7 Ellam St Victoria Park WA 6100

Phone: 08 62508053 , Fax: 08 62508050

Email: <mailto:brendan.imms@water.wa.gov.au> brendan.imms@water.wa.gov.au

cid:image001.jpg@01CB7A92.0FF68860

From: Bruce Bowman [mailto:bruce@bowmanassociates.com.au]
Sent: Wednesday, 19 November 2014 9:45 AM
To: IMMS Brendan
Subject: FW: Application for permit to interfere with the 13 Mile Brook

Hi Brenan,

An update on the Allawuna Farm Landfill proposal is that all issues before DAP have been addressed except the works approval from the DER. The DER has concerns regarding our understanding of groundwater under the landfill area and we are addressing these concerns and resubmitting the works approval.

In the interim the client, SITA, is considering its options to commence part of the project construction including intersection upgrade at the highway, entrance road and crossing over the 13 Mile Brook.

Is the DoW able to issue the permit independent of the DAP and DER process.

Regards,

Bruce Bowman

Bowman & Associates Pty Ltd

8/640 Beeliar Drive

SUCCESS WA 6164

Phone: 0402 373 582

www.bowmanassociates.com.au <http://www.bowmanassociates.com.au/>

From: Adam Davies [mailto:adam@bowmanassociates.com.au]
Sent: Friday, 15 August 2014 4:00 PM
To: 'Bruce Bowman'
Subject: FW: Application for permit to interfer with the 13 Mile Brook

Regards,

Adam Davies

Environmental Engineer

Bowman & Associates Pty Ltd

8/640 Beeliar Drive

SUCCESS WA 6164

Ph: (08) 9414 9670

www.bowmanassociates.com.au <http://www.bowmanassociates.com.au/>

From: IMMS Brendan [mailto:Brendan.Imms@water.wa.gov.au]
Sent: Friday, 15 August 2014 3:30 PM
To: 'adam@bowmanassociates.com.au'
Subject: Application for permit to interfer with the 13 Mile Brook

Good Afternoon Mr Davies,

As discussed on the phone this afternoon, DoW wishes to wait until a final decision on the Allawuna proposal has been arrived at before proceeding with the full assessment of the permit to interfere with the bed and banks of 13 Mile Brook for the purposes of constructing a vehicle crossing.

Nonetheless, I have looked over the information provided with the Form 3P you have sent in and at this stage can see no reason that would prevent the issuing of a permit for the crossing, should the landfill proposal go ahead.
The permit would likely be issued with conditions including but not limited to the following:

. The permit holder shall ensure that the crossing does not act as

an artificial barrier or levee, causing water to pond upstream.

. The permit holder shall stabilise all sites affected by construction or removal activities using methods described in Steam Stabilisation, River Restoration Report No. RR 10.

. The permit holder shall rehabilitate all sites affected by construction or removal activities with species that are native to the botanic region and within the same local provenance. Sites shall be planted to a similar density and diversity to local indigenous riparian zone habitats.

. All material used for rehabilitation works on the river bed or banks shall be free of no-indigenous plant material.

Regards,

Brendan Imms

Natural Resource Management Officer

Department of Water - Swan Avon Region

7 Ellam St Victoria Park WA 6100

Phone: 08 62508053 , Fax :08 62508050

Email: brendan.imms@water.wa.gov.au

cid:image001.jpg@01CB7A92.0FF68860

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## ATTACHMENT D2

**Water Dam Correspondence**

**From:** VISKOVICH Matthew [mailto:Matt.VISKOVICH@water.wa.gov.au]
**Sent:** Wednesday, 1 July 2015 3:50 PM
**To:** Rushton, David
**Subject:** RE: proposed stormwater dam in Avon River Catchment Area

Hi Dave,

I understand that our Swan Region may have already provided advice in relation to this proposal, so I recommend you speak with James Mackintosh (telephone 6250-8043).

Generally a 5C surface water licence is only required if a person wants to take water directly from a proclaimed watercourse. Therefore if the dam is not constructed across a proclaimed water course then a licence is not required.

Regards
MAtt

**From:** Rushton, David [mailto:DRushton@golder.com.au]
**Sent:** Wednesday, 1 July 2015 2:44 PM
**To:** VISKOVICH Matthew
**Subject:** RE: proposed stormwater dam in Avon River Catchment Area

Thanks very much Matt.

Can you please also confirm that a surface water licence for abstraction of water from the stormwater dam is also not necessary in this instance.

regards
Dave

**From:** VISKOVICH Matthew [mailto:Matt.VISKOVICH@water.wa.gov.au]
**Sent:** Wednesday, 1 July 2015 8:43 AM
**To:** Rushton, David
**Subject:** RE: proposed stormwater dam in Avon River Catchment Area

Hi Dave,

Based on the information provided below, the property is not located within a proclaimed groundwater area. Therefore, a groundwater licence is not required for abstracting water from non-artesian bores/wells, including excavations that intercept the water table. Below is a link to our website and proclaimed area maps for future reference.

http://www.water.wa.gov.au/maps-and-data/maps/proclaimed-area-maps

Regards
Matt
**From:** Rushton, David [mailto:DRushton@golder.com.au]
**Sent:** Tuesday, 30 June 2015 3:03 PM
**To:** VISKOVICH Matthew
**Subject:** proposed stormwater dam in Avon River Catchment Area

Hi Matt.

As discussed, I need to confirm whether there are any water licences or other DoW approvals applicable to the proposed construction and use of a stormwater dam on a property in the Avon River Catchment Area.

The stormwater dam is a component of a proposed landfill facility that is the subject of a Works Approval Application currently being assessed by the DER. When/if approved and constructed, the landfill facility and associated stormwater dam will be located on a property known as Allawuna Farm on Lots 4869, 5931, 9926 and 26934 in Certificate of Title Vol 285, fol 78A, Great Southern Hwy, Saint Ronans in the Shire of York.

The stormwater dam has been designed to prevent the interaction of stormwater and landfill leachate and will be located approximately 250 m from the Thirteen Mile Brook. It will be used to capture and store run-off from the small catchment to the east of the landfill footprint and water from the dam will be used for dust suppression during landfill construction and operation. The dam will have an overflow channel capable of carrying a peak 1 in 50 year storm discharge into Thirteen Mile Brook.

Apparently the dam will intercept the water table.

Please advise in relation to RiWi Act licensing requirements.

Thanks & regards
Dave

**David Rushton (B.Sc.Env.Mgt)** | Senior Environmental Scientist | **Golder Associates Pty Ltd**
Level 3, 1 Havelock Street, West Perth, Western Australia 6005, Australia (PO Box 1914, West Perth WA 6872)
**T:** +61 8 9213 7600 | **D:** +61 8 9213 8247 | **F:** +61 8 9213 7611 | **M:** +61 0479 176 221 | **E:** DRushton@golder.com.au | **www.golder.com**

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## ATTACHMENT E

**Odour Management Plan**


THE LEADER IN RESOURCE RECOVERY

# ALLAWUNA FARM LANDFILL – ODOUR MANAGEMENT PLAN

This report describes the odour management measures proposed for the landfill facility at Allawuna Farm in the Shire of York.

blank page

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|---|---|---|---|---|
| 1 | 6/07/15 | Stefan Berger | Bruce Bowman | |
| 2 | 9/07/15 | Stefan Berger | Bruce Bowman |  |
| | | | | |
| | | | | |
| | | | | |

## DOCUMENT DISTRIBUTION

| VERSION | TYPE | FORMAT | ISSUED TO | ORGANISATION |
|---|---|---|---|---|
| 1 | PDF | electronic | John Jones | SITA Australia Pty Ltd |
| 2 | PDF | electronic | John Jones | SITA Australia Pty Ltd |
| | | | | |
| | | | | |

## FILE NAME

150709 BB Allawuna Odour Mgmt Plan.docx

blank page

## TABLE OF CONTENTS

## FIGURES



## TABLES



## APPENDICES



## ACRONYMS

| | |
|---|---|
| DAFWA | Department of Agriculture of Food Western Australia |
| DEC | Department of Environment and Conservation |
| ENVALL | Environmental Alliances Pty Ltd |
| EPA | Environmental Protection Authority |
| Guideline | Odour Methodology Guideline |
| MRWA | Main Roads WA |
| WA | Western Australia |
| RAV | Restricted Access Vehicle |
| USEPA | United States Environmental Protection Agency |
| VIC-BPEM | Victorian Best Practice Environmental Management |

## UNITS OF MEASURE

| | |
|---|---|
| km | Kilometre |
| m | Metre |
| mm | Millimetre |
| ou | Odour units |

# 1 PRELIMINARIES

## 1.1 SITA AUSTRALIA

SITA Australia (SITA) wishes to develop a landfill facility in the Shire of York. The proposed facility will be located on Allawuna Farm, Saint Ronans, the location of which is shown below. The local site location is shown in **Figure 1**. It is proposed that this facility would receive putrescible waste, clean fill, Type I & II Inert Waste, contaminated solid waste[1] and Type I & II Special Waste. The facility will accept up to 250,000 tonnes of waste annually.

**Figure 1: Landfill location.**


This noise management plan outlines the measures that will be put in place to ensure that the surrounding community and SITA employees do not suffer from a loss of amenity due to noise emissions originating from within the proposed site.

## 1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a standard set of instructions and procedures that will be adopted during the operation of the landfill facility owned by SITA. All staff at the facility are expected to understand and follow the procedures outlined.

## 1.3 LOCATION

The site is located on the southern side of Great Southern Highway approximately 80 km by road from Perth and 20 km by road from York. The landfill will occupy a portion of Lot 4869 Great Southern Highway, Saint Ronans. The site is located east of the Swan Coastal Plain, in the Darling Scarp. The site was selected as the optimal choice after an investigation of nineteen potential sites undertaken by SITA.

## 1.4 NEAREST RECEPTORS AND BUFFER DISTANCES

The Environment and Protection Authority's (EPA) Guidance Statement No 3, *Separation Distance between Industrial and Sensitive Land Uses,* recommends a buffer distance of 150 metres between a Class II or III landfill and a single residence. The distance between the proposal and the nearest single residence is 1,900 metres. The Guidance Statement also recommends a buffer distance of 35 metres

[1] Meeting waste acceptance criteria specified for Class II landfills.

between a Class II or III landfill and the boundary of the property on which it is located. The proposed facility is located 600 metres from the Allawuna Farm's property boundary. **Table 1** provides a summary of the relevant buffer distances.

**Table 1: Buffer Distances**

| DESCRIPTION | BUFFER DISTANCE (m) |
|---|---|
| Minimum DER requirement for sensitive receptor land use from putrescible landfill | 500 |
| Minimum DER requirement for single residence from putrescible landfill | 150 |
| Proposed landfill to Lot Boundary | 600 |
| Proposed landfill to nearest neighbouring dwelling (single residence) | 1,900 |
| Proposed landfill to Mount Observation picnic area | 4,600 |
| Proposed landfill to Wandoo National Park | 1,000 |
| Proposed leachate dams to Thirteen Mile Brook | 270 |
| Proposed landfill to Thirteen Mile Brook | 350 |

## 1.5 CLOSEST RESIDENCE

The closest residence to the property is approximately 1.9 km to the north-east of the landfill. The next closest residence is situated 2.4 km from the proposed facility. These distances were measured using Google Earth and are an approximate only. No residences have a direct line of sight to the proposed site; all are screened by vegetation and sloping hills due to the topography of the landscape.

## 1.6 SURROUNDING LAND USES

Two properties in the vicinity of Allawuna Farm have been identified in the Department of Agriculture of Food Western Australia (DAFWA) sensitive sites database. One is listed as a bio-dynamic site and the other as an organic site. The property boundary of the bio-dynamic site is approximately 700 m from the Allawuna Farm property boundary and 2.5 km from the proposed landfill footprint. The organic site is approximately 1.3 km from the Allawuna Farm property boundary and 2.0 km from the proposed landfill footprint.

Given the relatively large buffer distances between these properties and the proposed landfill and the planned management strategies for potential emissions originating from the landfill, the proposed development is expected to have no impact on either of the sensitive surrounding land uses identified.

# 2 ODOUR SCIENCE

The *Odour Methodology Guideline* (the Guideline) published by the Department of Environment and Conservation (DEC) states that in order to accurately and completely describe an odour, four different characteristics are often considered:

- Odour detection threshold; the lowest odorant concentration necessary for detection by a certain percentage of the population (usually 50%). The concentration is defined as one (1) odour unit.
- Odour intensity; perceived strength of an odour above its threshold. Determined by an odour panel and described in categories which progress from 'not perceptible', to 'very weak', through to 'very strong'.
- Hedonic tone; the degree to which an odour is perceived as pleasant or unpleasant. It must be noted that such perceptions differ wildly from person to person and are strongly influenced by previous experience and emotions at the time of perception.
- Odour character; what the odour smells like. Facilitates differentiation between different odours. May change with dilution.

Odours are commonly generated in landfills as a result of the following:

- the decomposition of recently deposited wastes;
- the presence of low concentrations of odorous substances in landfill gas which is produced some months after deposition; and
- leachate in the active cell and in leachate ponds.

The potential for such odour emissions to affect the amenity of surrounding areas hinges on two factors, namely the rate at which odours are emitted, and the atmospheric conditions during which the emission takes place.

# 3 LANDFILL OPERATIONS

## 3.1 OPERATING SCHEDULE

It is proposed that the facility will operate from 6 am to 5 pm Monday to Friday and from 6 am to 4 pm on Saturdays. The Saturday schedule will be followed for public holidays but the site will remain closed for New Year's Day, Good Friday and Christmas Day.

## 3.2 QUALITY CERTIFICATION

SITA has a certified system for the management of the Environment (ISO 14001), Health and Safety (AS 4801) and Quality (ISO 9001). The management processes at Allawuna Farm Landfill will tie into these certified systems.

## 3.3 LOGISTICS AND TRAFFIC VOLUME

The development of the Allawuna Farm Landfill will generate road train vehicle movements between SITA's waste transfer stations in Welshpool and Landsdale and the landfill site. The development will eliminate the current transfer vehicle movement to the Shale Road Landfill on South Western Highway.

The transfer road trains will be Restricted Access Vehicles (RAV) Class 2, Category 3 in a pocket road train configuration, with a maximum length of 27.5 m. The pocket road trains will travel along the existing RAV Network 4 road system to the site via Gnangara Road, West Swan Road, Reid Highway, Roe Highway, Great Eastern Highway and Great Southern Highway. The existing RAV Network 4 intersections along the route are all sufficiently developed to accommodate the small increase in road train volume associated with the landfill development. **Figure 2** outlines the route that the waste transfer trucks will take.

**Figure 2: Waste transfer road train routes.**


When operating at maximum capacity one road train will depart the Perth region every 20 minutes for a total of 24 deliveries to the Allawuna Farm Landfill per day. If additional cover material is required for landfill operations up to one additional truck per day carrying recycled brick road base or similar material may also access the site, as is currently the practice at Shale Road Landfill.

The development of the site will have a negligible effect on the road network in the metropolitan area and a minimal impact on Great Southern Highway vehicle volumes. As road train loads are evenly distributed across the day, the impact on peak traffic times is also considered to be negligible.

A comprehensive review of the available traffic data from the Main Roads WA (MRWA) *Traffic Digest* compared with the proposed increase in vehicle movements found the increase in Great Southern Highway vehicle volumes would be less than 3% on 2008/09 volumes.

A small number of light vehicle movements for facility staff entering and departing the site in the morning and evening will also occur. The expectation is that most employees will be residents of the York area, with an expected 30-40 vehicle single directional movements a day between York and the site. This volume represents a 2-3% increase in traffic between York and Allawuna.

## 3.4 LANDFILLING

The placement and covering of waste will be in accordance with the Victorian Best Practice Environmental Management (VIC-BPEM) guidelines for landfills. Cover material and internal roads will be made from material excavated during cell construction or waste materials with appropriate properties for vehicle traffic such as builders' rubble, crushed concrete and on the landfill area shredded wood.

The waste will be placed by maintaining one active tipping area that is as small as possible. The landfill will be effectively compacted to minimise long term settlement and maximise the use of the available airspace. The compactor will make three to five passes over waste that has been placed in 500 mm layers. Emplaced waste will be completely covered at the end of each day.

## 3.5 TIPPING AREA

The following management measures will be adhered to during waste receival:

- Tipping area to be restricted to a maximum length of 30 m;
- Tipping area no more than 2 m in height; and
- Odorous loads to be prioritised for burial.

### 3.5.1 Landfill Cover

Landfill cover is an essential and necessary part of landfilling operations. There are a range of environmental and health impacts that can be mitigated through the use of landfill cover, including:

- minimising landfill odours;
- controlling litter;
- fire prevention;
- controlling disease vectors such as birds, flies, mosquitoes and rodents;
- ensuring that the landfill is trafficable;
- limiting the infiltration of water; and
- minimising the emission of landfill gas.

#### 3.5.1.1 Cover Material

The cover material will typically be inert sand/soil. At least two weeks' worth of cover material will be available on-site under all weather conditions. A stockpile of the cover material will be located adjacent to the tipping face, wherever possible.

Waste will be covered at the end of every operating day to a minimum cover thickness of 225 mm.

#### 3.5.1.2 Intermediate Cover

For surfaces that are expected to remain exposed for a period of ninety (90) days or more, an intermediate cover material will be applied to a minimum depth of 300 mm. The cover will be graded at a minimum slope of 2% away from the void face to promote water runoff and limit the potential for leachate build-up against the void face.

When these areas are due for further filling, the intermediate cover will be stripped off or ripped in order to minimise the potential for a perched leachate level to subsequently develop over the intermediate cover.

## 3.6 ODOUR MANAGEMENT MEASURES

Further measures that will be put in place at the Allawuna Farm Landfill to manage odours on a day-to-day basis include:

- Daily odour monitoring of the landfill and surrounds by site staff via a 'sniff test'. This test will be carried out in accordance with the United Kingdom Environmental Agency's *Guidance for H4 Odour Management*. Staff will use the SUEZ Odour Audit Tool (**Appendix A**) to record the results of the odour monitoring;
- Requirement for all loads arriving at and leaving the facility to be covered;
- Complaints and Investigation Procedure in place to respond to any complaints from the local community;
- Landfill gas capture system – operated by a specialist contractor;
- Regular monitoring of emissions from the landfill surface;
- Effective and responsible leachate management (immediately clearing any spillages and not allowing leachate to pond on the landfill); and
- Maintenance of temporary and permanently capped areas.

### 3.6.1 Procedure for odour management during the drilling of wells

SITA will adhere to the following procedure regarding the drilling of gas wells at the landfill:

- Notifying the local community of impending drilling;
- Additional odour monitoring on site;
- Prompt removal and disposal of drill arisings at the working face of the landfill. Odour neutraliser will be sprayed on to arisings, and all arisings will be disposed of by the end of the working day;
- Area around drilled well to be covered with fresh daily cover, if required;
- No partly drilled wells will be left open overnight;
- Capping and sealing of wells to take place the same day that they are drilled;
- Connection of new wells to the gas extraction system as soon as practicable; and

- Drillers to be fitted with personal $H_2S$ monitors to ensure that they do not suffer the effects of over-exposure/inhalation.

It should be noted that a mobile odour suppression unit will be on hand during the drilling of gas wells for use, if required.

## 3.7 CONTINGENCY PLAN

In the unlikely event that odour accumulates in the valley and the regular management measures are unsuccessful in achieving odour dispersal, the areas of fugitive landfill gas emissions will be identified and remediated via the drilling of additional gas wells, or via the use of a temporary geomembrane cap. The monitoring of the landfill gas infrastructure will occur 24 hours-a-day, 7 days-a-week, to facilitate the rapid response in the event of a breakdown.

# 4 ODOUR ASSESSMENT

Environmental Alliances Pty Ltd (ENVALL) was commissioned to undertake an odour impact assessment for the proposed landfill facility. The report by ENVALL describes the results of a study to estimate the level of odours from the proposed landfill and is based on landfill operations at a maximum capacity of 250,000 tonnes of waste being landfilled per annum. The following sections summarise ENVALL's report and recommendations.

## 4.1 ODOUR MEASUREMENT

The basis for quantifying odour concentrations is "dynamic olfactometry", which is the term used to describe the measurement of odour by presenting a sample of odorous gas to a panel in a variety of dilutions before seeking a response from the panellists on whether they can detect the odour.

## 4.2 ODOUR MODELLING

ENVALL followed the Guideline in carrying out the odour assessment of the proposed landfill and identified the key odour-emitting sources as the working tip face and the leachate dam. The odour emission rates from these two sources were derived from measurements made at the Henderson Waste Recovery Park as the nature and amount of waste received is similar to that expected for Allawuna.

The CALPUFF model was used for the modelling of the dispersion of odours. The U.S. Environmental Protection Agency (USEPA) lists CALPUFF in its *Guideline of Air Quality Models* as the preferred model for assessing long range transport of pollutants.

### 4.2.1 Conservative Odour Emission Rates

The surface area of the leachate dam was assumed to be that of the full extent of the capacity. It should be noted that this will rarely, if ever, be the case. As such, it can be said that the emissions from the leachate dam have been over-estimated and therefore contribute to a conservative estimation of odour impacts from Allawuna Farm Landfill.

It should also be noted that odour emissions sampled from Henderson Waste Recovery Park were after a prolonged period of hot weather, which meant that the putrescible waste received at the facility was in a more advanced state of decomposition (and therefore more odorous) than usual. The 'summer-time' emission rates are not indicative of the average, year-round emission rates.

## 4.3 RESULTS

ENVALL concluded that based on their modelling predictions, "*there should be considerable confidence that the proposed Allawuna Landfill, if operated according to the assumed management practices, will not cause unacceptable odour impacts*". The output of the model has been attached as **Appendix B**, and shows the extents of odour impacts using various criteria.

The conservative approach to modelling odour transport combined with the fact that there is a considerable distance between the most stringent predicted extent of the unacceptable odour impacts and the location of the nearest sensitive receptor (almost 2 km), mean that the management measures outlined in this plan will ensure that the amenity of the surrounding community will be preserved throughout the construction and operation phases of the Allawuna Farm Landfill.

# 5 REFERENCES

Department of Environmental Protection (DEP), 2002. Odour Methodology Guideline.

Environmental Protection Authority, 2005. Guidance Statement No 3, Separation Distance between Industrial and Sensitive Land Uses.

U.K. Environment Agency, 2011. H4 Odour Management, Bristol, United Kingdom.

U.S. Environmental Protection Agency, 2000. Meteorological Monitoring Guidance For Regulatory Modeling Applications, Research Triangle Park, North Carolina.

# 6 APPENDICES

## Faciltiy Odour Audit Tool

Facility Name : ……

Conducted by : ……

Date :

| 1 Landfill Operations | Potential for Odour Priority 1 | 2 | 3 | 4 | Comments/Recommendations |
|---|---|---|---|---|---|
| **1.1 Screening**<br>Are any parts of the landfills visible from public areas?<br>Is the facility well screened and landscaped?<br>Is the waste disposal area visible to the public?<br>Is the gas management compound or flare visible?<br>Is there an open flare which is visible at night?<br>Is there mud tracking out of the site gates?<br>Is dust supression carried out?<br>Are scavenging birds causing visual intrusions? | | | | | |
| **1.2 Waste Acceptance**<br>Does the facility accept any highly odorous waste e.g. offal, egg. sewarage or fish waste?<br>Is there a procedure in place for accepting highly odorous waste?<br>If so is the procedure being applied and is it acceptable?<br>Do lorries transporting waste to the site pass local residents houses?<br>Are all loads sheeted/covered? | | | | | |
| **1.3 Waste Placement Operations**<br>Is waste pushed over and compacted as soon as it is tipped?<br>Is equipment being used to place waste adequately sized and able to cope with peak demand?<br>Are there back up machines available to compact and cover waste?<br>Is waste progressively covered throughout the working day?<br>What is the area of exposed waste in the tipping location? Does it comply with the licence?<br>Is all waste covered on a daily basis? What depth of cover is used?<br>Is material used for daily cover suitable?<br>What form of ADC is used? Is it appropriate? Does it mitigate odours?<br>Are there any areas of exposed waste?<br>Is there an odour supression system in place? Is it working/well maintained?<br>Is previously deposited waste ever excavated? Is there a procedure in place for this? | | | | | |
| **1.4 Landfill Gas Management**<br>Is landfill gas balanced on a regular basis e.g. weekly or monthly?<br>Check the latest gas balancing records?<br>Is the gas management system well maintained -<br>Are there any uncapped wells venting gas?<br>Is there good falls on all the pipe work? Are there any condensate blockages?<br>Are all gas wells fitted with monitoring points and control valves?<br>Are there any obvious emissions of gas or odours from the vicinity of any of the gas wells?<br>What is the approximate spacing of gas wells?<br>Given the nature of the waste is the spacing reasonable?<br>Is there an up to date drawing of the gas extraction system available?<br>Is there suffient suction pressure available to all part of the system?<br>In the event of engine breakdown or maintenance is there full back up flaring capacity available?<br>In the event of power failure or engine breakdown is there back up power available to run the system?<br>In the event of engine/flare breakdwon what is the call out procedure/response time?<br>Is there gas extraction available in the active cell? What is in place, is it adequate?<br>How quickly is gas extraction installed in new cells?<br>Are there any localised gas odours anywhere on site e.g. slopes, near gas wells, active cell, roads etc<br>Is the gas extraction system checked on a daily basis by trained personnel?<br>What training have site personnel received? Is it adequate?<br>What is the procedure for drilling gas wells? How are odours managed/mitigated?<br>Once drilled how quickly are wells hooked up to the gas extraction system? | | | | | |
| **1.5 Leachate Management**<br>Are there any areas where leachate is ponding on the landfill?<br>Are there any perched leachate outbreaks/pop outs?<br>Are leachate ponds a source of odour?<br>Are leachate ponds located appropriately away from receptors?<br>Is leachate used for dust supression at the facility?<br>Is leachate collected from the site by tanker? Are there any odours associated with loading the tanker?<br>Are all leachate chambers/risers sealed and connected to the gas extraction system? | | | | | |
| **1.6 Temporary and Permanent Capping**<br>What area of the site is permanently capped?<br>What area of the site is temporary capped?<br>Are temporary capped areas capped with suitable materials e.g. impermeable clay or gmb?<br>Are long term waste slope temporary capped with clay or gmb?<br>Is cover maintained on temporary capped areas? Is there any erosion or exposed waste? | | | | | |
| **1.7 Environmental Monitoring**<br>When was the last FID survey carried out? Have all emissions been remediated?<br>Does the FID survey check every gas well?<br>Is daily odour monitoring carried out both on and off the site - check records?<br>Check and comment on complaints record?<br>Do site staff liaise directly with members of the public?<br>What third party odour monitoring is carried out at the facility?<br>Is there a communications plan and complaints response procedure in place? Are they adequate?<br>Is there an active CRG in place?<br>Is there a weather station on site to record wind speed, direction, temperature and pressure? | | | | | |

| | |
|---|---|
| 1 | Acceptable |
| 2 | Minor improvements required - very low potential of off site odour generation |
| 3 | Improvement required as soon as possible - potential for off site odour |
| 5 | Immediate action required to rectify the situation |

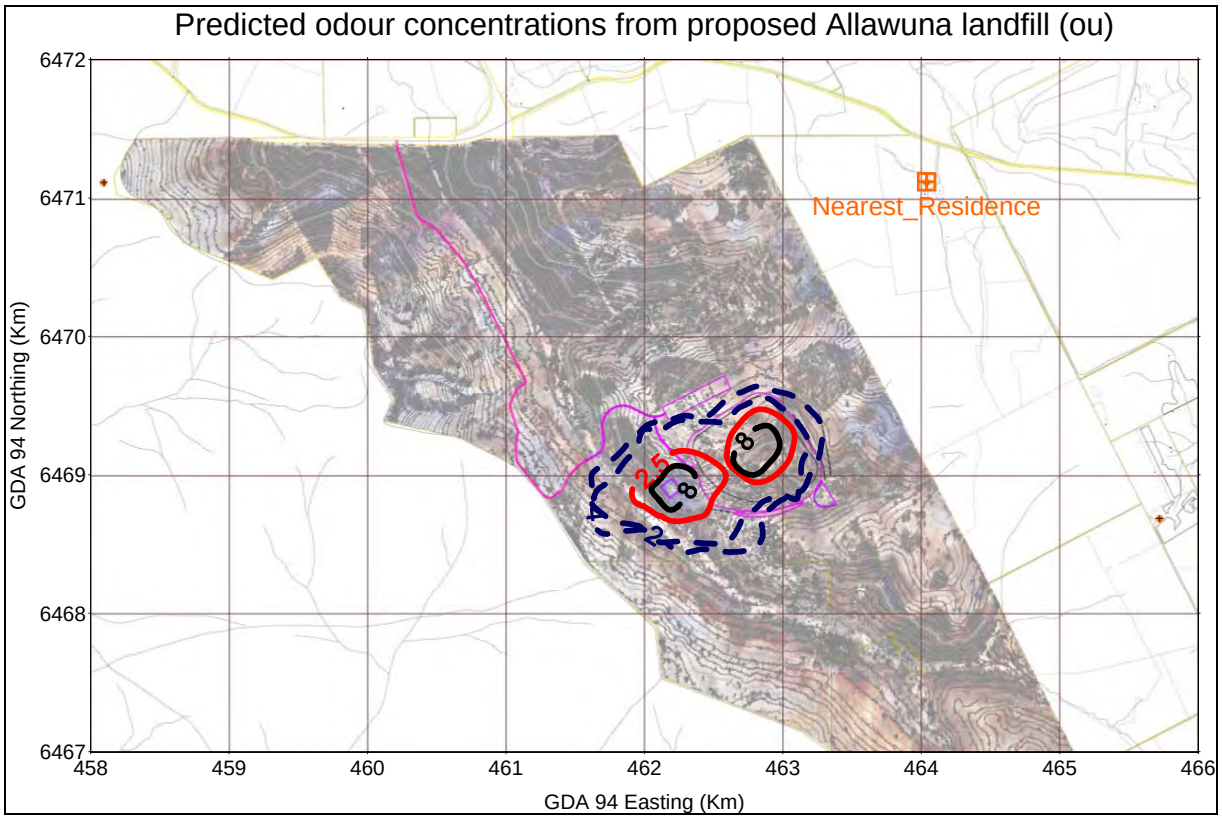


**Figure 5 Extents of odour impacts using various criteria from proposed Allawuna Landfill**

Notes:

Landfill footprint and infrastructure outlines shown as pink lines.

Queensland (and current DEC) criterion - 2.5 ou, 1- hour average, 99.5 percentile (red). Proposed DEC replacement criterion - 8 ou, 1- hour average, 99.9 percentile (black).

"Green light" criteria - 2 ou, 3-minute average, 99.5 percentile and 4 ou, 3-minute average, 99.9 percentile (light blue).

## ATTACHMENT F

**Dust Management Plan**


# ALLAWUNA FARM LANDFILL – DUST MANAGEMENT PLAN

This report describes the dust management measures proposed for the Landfill Facility at Allawuna Farm in the Shire of York.

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# TABLE OF CONTENTS

## APPENDICES



## TABLES

## ACRONYMS

| | |
|---|---|
| EPA | Environmental Protection Authority |
| EP Act | Environment Protection Act |
| NEPM | National Environmental Protection Measure |
| NHMRC | National Health and Medical Research Council |
| PPE | Personal Protection Equipment |
| PM | Particulate Matter |
| TSP | Total Suspended Particulate |
| WA | Western Australia |
| DAFWA | Department of Agriculture and Food Western Australia |

## UNITS OF MEASURE

| | |
|---|---|
| ha | Hectares |
| km | Kilometre |
| m | Metre |
| mm | Millimetre |
| $m^2$ | Square Metre |
| $m^3$ | Cubic Metre |
| µm | Micro Metre |
| $\mu g/m^3$ | Microgram per Cubic Metre |

# 1 PRELIMINARIES

## 1.1 SITA AUSTRALIA

SITA Australia (SITA) wishes to develop a landfill facility in the Shire of York. The proposed facility will be located on Allawuna Farm, Saint Ronans, the location of which is shown below. It is proposed that this facility would receive putrescible waste, clean fill, Type I & II Inert Waste, contaminated solid waste[1] and Type I & II Special Waste. The facility will accept up to 250,000 tonnes of waste annually.


## 1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a standard set of instructions and procedures that should be adopted for dust suppression during the operation of the landfill facility owned by SITA. All staff at the facility are expected to understand and follow the procedures outlined.

## 1.3 NEAREST RECEPTORS AND BUFFER DISTANCES

The Environment and Protection Authority's (EPA) Guidance Statement No 3, *Separation Distance between Industrial and Sensitive Land Uses,* recommends a buffer distance of 150 metres between a Class II or III landfill and a single residence. The distance between the proposal and the nearest single residence is 1,900 metres. The Guidance Statement also recommends a buffer distance of 35 metres between a Class II or III landfill and the boundary of the property on which it is located. The proposed facility is located 600 metres from the Allawuna Farm's property boundary. **Table 1** provides a summary of the relevant buffer distances.

[1] Meeting waste acceptance criteria specified for Class II landfills.

**Table 1: Buffer Distances**

| DESCRIPTION | BUFFER DISTANCE (m) |
|---|---|
| Minimum DER requirement for sensitive receptor land use from putrescible landfill | 500 |
| Minimum DER requirement for single residence from putrescible landfill | 150 |
| Proposed landfill to Lot Boundary | 600 |
| Proposed landfill to nearest neighbouring dwelling (single residence) | 1,900 |
| Proposed landfill to Mount Observation picnic area | 4,600 |
| Proposed landfill to Wandoo National Park | 1,000 |
| Proposed leachate dams to Thirteen Mile Brook | 270 |
| Proposed landfill to Thirteen Mile Brook | 350 |

The closest residence to the property is approximately 1.9 km to the north-east of the landfill. The next closest residence is situated 2.4 km from the proposed facility. These distances were measured using Google Earth and are an approximate only. No residences have a direct line of sight to the proposed site; all are screened by vegetation and sloping hills due to the topography of the landscape.

## 1.4 SURROUNDING LAND USES

Two properties in the vicinity of Allawuna Farm have been identified in the DAFWA sensitive sites database. One is listed as a bio-dynamic site and the other as an organic site. The property boundary of the bio-dynamic site is approximately 700 m from the Allawuna Farm property boundary and 2.5 km from the proposed landfill footprint. The organic site is approximately 1.3 km from the Allawuna Farm property boundary and 2 km from the proposed landfill footprint.

Given the relatively large buffer distances between these properties and the proposed landfill and the planned management strategies for potential emissions originating from the landfill, the proposed development is expected to have no impact on either of the sensitive surrounding land uses identified.

## 1.5 OPERATING SCHEDULE

It is proposed that the facility will operate from 6 am to 5 pm Monday to Friday and from 6 am to 4 pm on Saturdays. The Saturday schedule will be followed for public holidays but the site will remain closed for New Year's Day, Good Friday and Christmas Day.

## 1.6 QUALITY CERTIFICATION

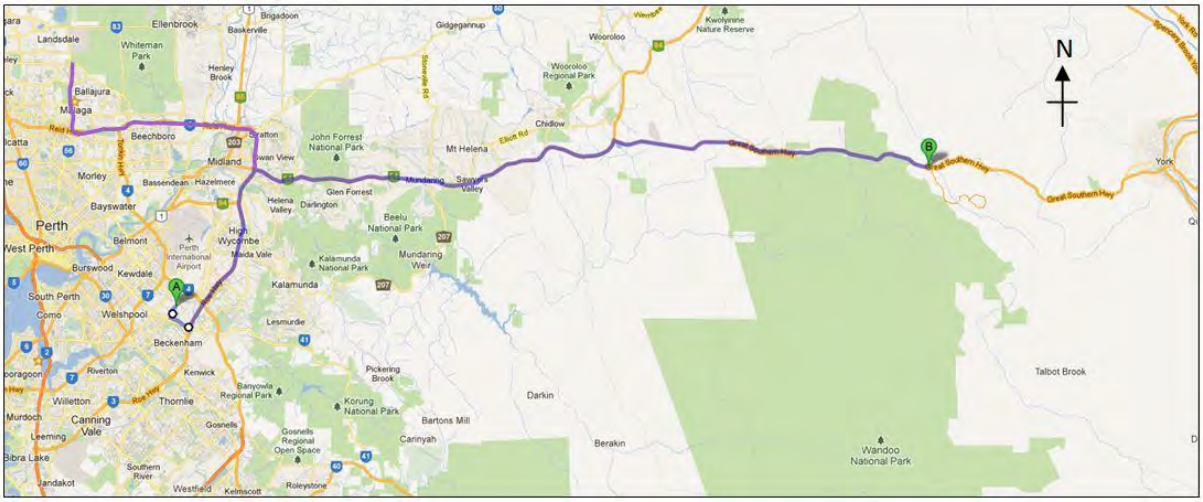
SITA has a certified system for the management of the Environment (ISO 14001), Health and Safety (AS 4801) and Quality (ISO 9001). The management processes at Allawuna Farm Landfill will tie into these certified systems.

## 1.7 LOGISTICS AND TRAFFIC VOLUME

The development of the Allawuna Farm Landfill will generate road train vehicle movements between SITA's waste transfer stations in Welshpool and Landsdale and the landfill site. The development will eliminate the current transfer vehicle movement to the Shale Road Landfill on South Western Highway.

The transfer road trains will be Restricted Access Vehicles (RAV) Class 2, Category 3 in a pocket road train configuration, with a maximum length of 27.5 m. The pocket road trains will travel along the existing RAV Network 4 road system to the site via Roe Highway, Great Eastern Highway and Great Southern Highway. The existing RAV Network 4 intersections along the route are all sufficiently developed to accommodate the small increase in road train volume associated with the landfill development. **Figure 1** outlines the route that the waste transfer trucks will take.

**Figure 1: Waste transfer road train route.**




When operating at maximum capacity one road train will depart the Perth region every 20 minutes for a total of 24 deliveries to the Allawuna Farm Landfill per day. If additional cover material is required for landfill operations up to one additional truck per day carrying recycled brick road base or similar material may also access the site, as is currently the practice at Shale Road Landfill.

The development of the site will have a negligible effect on the road network in the metropolitan area and a minimal impact on Great Southern Highway vehicle volumes. As road train loads are evenly distributed across the day, the impact on peak traffic times is also considered to be negligible.

A comprehensive review of the available traffic data from the Main Roads WA (MRWA) *Traffic Digest* compared with the proposed increase in vehicle movements found the increase in Great Southern Highway vehicle volumes would be less than 3% on 2008/09 volumes.

A small number of light vehicle movements for facility staff entering and departing the site in the morning and evening will also occur. The expectation is that most employees will be residents of the York area, with an expected 30-40 vehicle single directional movements a day between York and the site. This volume represents a 2-3% increase in traffic between York and Allawuna.

## 1.8 LANDFILLING

The placement and covering of waste will be in accordance with the VIC-BPEM guidelines for landfills. Cover material and internal roads will be made from material excavated during cell construction or waste materials with appropriate properties for vehicle traffic such as builders' rubble, crushed concrete or shredded wood.

The strategies employed will aim to prevent windblown litter, control birds and prevent vermin at the site. The waste will be placed by maintaining one active tipping area that is as small as possible. The landfill will be effectively compacted to minimise long term settlement and maximise the use of the available airspace. The compactor will make three to five passes over waste that has been placed in 500 mm layers. Emplaced waste will be completely covered at the end of each day. Waste will be placed in lifts of not more than 2.0 m deep to a maximum height as shown on **Drawing ALLA-WA-18** in the Works Approval document.

# 2 DUST MANAGEMENT PLAN

## 2.1 OBJECTIVE

To ensure that best practicable measures are taken to prevent dust emissions from adversely affecting the environment values or the health, welfare or amenity of people and nearby land users by meeting accepted guidelines, standards and criteria. *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities* (the Guideline) by the Department of Environment and Conservation has been adhered to in the preparation of this plan.

## 2.2 AIR QUALITY STANDARDS

Dust falls under the broad category of particulate matter (PM), tiny particles of solid or liquid suspended in a gas (including dust, smoke, soot and droplets of liquid). For monitoring purposes PM generally falls within three main categories:

- $PM_{10}$ particles with a diameter of 10 µm,
- $PM_{2.5}$ particles with a diameter of 2.5 µm, and
- Total Suspended Particulate (TSP) particles with a diameter less than 50 µm.

The EPA requires that air pollutants meet ambient air National Environmental Protection Measure (NEPM) standards and goals. In Western Australia the NEPM standards are implemented under the *National Environment Protection Council (Western Australia) Act, 1996.* The standards contained in the NEPM for ambient air quality in relation to particulates are shown in **Table 2**.

**Table 2: Standards and Goals for Particulates**

| POLLUTANT | PARTICULATE LEVEL | TIME PERIOD | GUIDANCE |
|---|---|---|---|
| Total Suspended Particulate Matter | 90 µg/$m^3$ | Annual | NHMRC, 2002 |
| Particulate matter <10 µg/$m^3$ ($PM_{10}$) | 50 µg/$m^3$ | 24 hour | NEPM, 2003 |
| Particulate matter ,<2.5 µg/$m^3$ ($PM_{2.5}$) | 25 µg/$m^3$ | 24 hour | NEPM, 2003 |

## 2.3 POTENTIAL IMPACTS

Excessive dust can have the potential for local impact. The nature and extent of the problem and the significance of the resulting effects usually depend on the nature of the source, sensitivity of the receiving environment and on individual perceptions. The level of tolerance to dust deposition can vary enormously between individuals.

The most common areas of concern with regards to airborne dust include:

- the visual soiling of clean surfaces, such as cars, window ledges and household washing,
- dust deposits on flowers, fruits or vegetables, and
- the potential for contamination of roof-collected water supplies.

Dust deposits can also have significant effects on plant life, although it must be noted that these impacts are usually realised at high dust loadings. Impacts include:

- reduced photosynthesis due to the reduction in light penetration through the leaves, which can cause reduced growth rates and plant vigour,
- increased incidence of plant pests and diseases, as dust deposits can act as a medium for the growth of fungal diseases,
- reduced effectiveness of pesticide sprays due to reduced penetration,
- rejection and downgrading of produce (a particular issue for horticultural crops).

Dust emissions may arise via traffic on internal unsealed roads, loading and unloading of materials, operation of heavy equipment and from exposed surfaces such as material stockpiles or the active landfill face. The magnitude of impact will depend on the size of the operation, local topography, adjacent land use, prevailing wind speed/direction, and distance to the nearest sensitive receptor. The objective of the dust management plan is to prevent the generation of airborne particulates (including dust) to ensure that no dust is discharged beyond the boundary of the site.

SITA shall undertake dust control measures as described in this document.

## 2.4 HEALTH

Excessive dust can potentially cause adverse health effects for workers within the site. Inhalation of dust particles may cause:

- irritation of the eyes,
- coughing,
- sneezing,
- hayfever, and/or
- Asthma attacks.

All workers undergo regular health checks and will have access to appropriate dust masks for use if required and be instructed in the use of dust minimisation equipment as outlined in the *Occupational Safety and Health Act 1984*.

## 2.5 DUST MANAGEMENT MEASURES

Day to day monitoring of dust will be conducted via a combination of visual means and through the use of data collected by a network of light-scatter aerosol monitors. The appropriate action will commence prior to dust impact occurring. The following natural barriers and process barriers will limit the generation of dust from the premises:

- Extensive vegetation exists within the Lot between the footprint of the proposed facility and the nearest residence. This will help reduce the wind speed in this direction and act as a filter for airborne particulate matter, and
- The vegetation along the access road will reduce disturbance to exposed layer of the gravel road and also assist in containing the dust generated by traffic to a certain extent.

As dust generating activities will occur in both the construction and operation of the landfill facility, the following mitigating measures may be employed during both construction and operation:

- Watering down of all unsealed trafficable areas at the commencement of each working day,
- Watering down of dust generating areas during construction and operation and maintaining a water supply on site for this purpose,
- Where possible, activities that have a high potential for dust generation (excavation, unloading of material etc.) shall be halted during adverse weather conditions where strong winds are blowing towards the nearby receptor to the north-east,
- Instruction will be given to all employees and site personnel on how to use the equipment to minimise dust,
- In the event that dust management objectives are not being achieved due to weather conditions or other factors, only those activities that do not generate dust will be undertaken,
- The access roads within the site will be watered down regularly throughout the day to minimise dust,
- Deliveries containing dry and/or dusty materials will be wetted down during the waste placement process,
- All complaints will be recorded and investigated (an example complaint form is attached in **Appendix A**),
- Restricting traffic to most direct route on the site and prohibiting traffic on non-active areas,
- Limiting the speed on the facility access road to 60 km/h and internal haul roads to below 20 km/h,
- Reducing dump heights to a maximum of 3 m wherever possible,
- During times of high ambient temperatures restrict excavation works to mornings where possible,
- Visual observations on site will allow for dust emissions to be monitored on a regular basis in the active construction stage and during the operation of the facility,
- If observations indicate that dust is being generated from within the site, additional dust management techniques will be adopted using water trucks or sprays for immediate action and mulching, hydro seeding or chemical crusting agents as a possible longer term solution,
- All trucks entering and leaving the will be covered to prevent windblown emissions,
- All trucks leaving the site will drive over a wheel cleaner prior to exiting the landfill infrastructure area,
- No burning of waste materials will be permitted on site and smoking will not be permitted unless in designated areas,
- Good housekeeping practices will be adopted on site to minimise dust generation. All materials stored in locations which have the capacity to generate dust will be either adequately covered or wetted down during times conducive to dust generation,
- The Site Supervisor will be responsible for maintaining a complaints register, which will be established to record and resolve, among other complaints, any dust related complaints, and
- The Site Supervisor will contact any complainants that have concerns related to dust and determine the nature of the nuisance and implement any changes necessary to mitigate dust generation and dust moving beyond the site boundary.

# 3 DUST MONITORING PLAN

The site is surrounded by agricultural land under cultivation and cropping which provides potential for high levels of background dust generation. Dust generated within the site will be created during the construction of the facility, via transport across the unsealed roads and later during the placement of waste. The large buffer distance between the facility footprint and the property boundary serves to minimise the risk of dust leaving the property.

## 3.1 DUST MONITORING LOCATIONS

Physical monitoring of dust levels at four locations on the property will be undertaken. These locations will be at the property boundary in the direct line between the three closest receptors and the site and adjacent to the site infrastructure area, as shown in **Appendix B**. These sites have been chosen based on a combination of prevailing wind data (see **Appendices C** and **D**), the location of nearby sensitive receptors and in accordance with *AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Guide to siting monitoring equipment*. The sites' proposed use implies their classification under *AS/NZS 3580.1.1:2007* as either a '*background site*' or a '*peak site*' as the aim of the monitoring program is to provide insight into background ambient air quality whilst also facilitating the monitoring of the landfill's air quality compliance. Background sites will be located on the property boundary and are classified as being,

> "*located in urban or rural areas to provide information on background levels. Background sites are usually in areas of homogeneous land use and geography. These sites can be especially useful for assessing transportation of pollutants into a region."* (Standards Australia/New Zealand Standard 2007)

The peak site will be located directly adjacent to the site infrastructure and as such is in line with the classification under *AS/NZS 3580.1.1:2007* as being,

> "*located where the highest concentrations and exposure are expected to occur e.g. near roads, in the CBD or near industrial sources. These sites are especially useful for air quality compliance monitoring and source monitoring.*" (Standards Australia/New Zealand Standard 2007)

The combination of background and peak sites will ensure that the monitoring network will provide an accurate understanding of background ambient air quality whilst providing a precise snapshot of point source emissions emanating from the site's plant, infrastructure and operational movements.

## 3.2 CLIMATE AND AEROSOL MONITORING EQUIPMENT

The site will have equipment to monitor wind direction and temperature. A windsock will be installed on site to indicate the wind direction and approximate wind strength. High wind speeds will be determined by the windsock's angle relative to the mounting pole and via the use of hand held anemometers. To facilitate the accurate and objective measurement of the amount of dust generated by the landfill operations, Met One Instruments' E-Sampler light-scatter aerosol monitors, or similar, will be installed at the aforementioned locations. Features of the E-Sampler aerosol monitors include:

- Programmable auto-zero,
- Programmable auto-span,
- Auto-ranging (1 to 65,000 $\mu m/m^3$),
- Automatic flow control protocol,
- Internal battery (30 hours of operation),

- Laser-Diode precise optical engine,
- Integral 47 mm analysis filter,
- Ambient pressure and temperature,
- Completely contained in a weatherproof aluminium enclosure,
- Internal data logger, and
- $PM_{10}$, $PM_{2.5}$, $PM_1$, TSP monitoring.

**Table 3** below summarises the specification of the E-Sampler light-scatter aerosol monitors. Each of the E-Sampler units will record the following information:

- $PM_{10}$,
- Wind direction,
- Wind speed, and
- Ambient temperature.

**Table 3: Proposed light-scatter aerosol monitor specifications.**

| Met One Instruments' E-Sampler Specifications | |
|---|---|
| Concentration Ranges (Auto-Ranging) | 0-0.5, 0-1, 0-10, 0-65 mg/$m^3$ |
| Sensitivity | 0.001 mg/$m^3$ |
| Sample Period | 1 sec |
| Sample Flow Rate | 2 LPM |
| Accuracy | 8% of NIOSH 0600 |
| Precision | 0.003 µg/$m^3$ or 2% reading |
| Particle Size Sensitivity Range | 0.1-100 micron |
| Long Term Stability | 5% reading |
| Sensor Type | Forward Light Scatter |
| Average Period | 1 – 60 minutes |
| Traceable Testing | Gravimetric |
| Sample Line Heater | Configurable RH controlled |
| Data Storage Capacity | 10,000 Records |
| Temperature Range | -10 to 50 °C |
| Ambient Temperature | -30 to +50°C |
| Ambient Pressure | 1040 to 600 mbars |
| Size (mm) | 267 x 235 x 145 |

## 3.3 BACKGROUND DUST GENERATION

Records such as date, time, wind patterns and atmospheric temperature will be kept regarding dust generation due to cultivation, harvesting, fire and other noticeable contributors to dust generation around the site.

## 3.4 DUST MONITORING FREQUENCY

The performance of the proposed dust suppression measures will be assessed by monitoring physical and visible dust arising from within the site. The list of monitoring measures proposed for the assessing performance is shown in **Table 4** below.

**Table 4: Proposed Frequency and Staff Responsible for Dust Monitoring**

| PROGRAMME | FREQUENCY | RESPONSIBLE PERSON |
|---|---|---|
| Visual inspection of dust leaving the boundary of the premises. | Continuously during every operating day. | Site Manager. |
| Visual inspection of dust generation at the site access from the Great Eastern Highway. | Twice daily. | Delivery Contractors. |
| Visual inspection of dust generation on internal haul road. | Continuously during every operating day. | Site Manager. |
| Dust monitoring at three locations at the property boundary and one location at the site infrastructure. | Monthly | Site Manager. |
| Collection of litter in and around the premises including clearance of litter from fixed and mobile litter screens. | Daily. | Site Manager. |
| Ambient air quality monitoring via light-scatter aerosol monitors. | Quarterly. | Site Manager. |
| Maintenance of Plant. | As required or in accordance with manufacturer recommendations. | Workshop mechanic and site Manager. |

## 3.5 DUST SUPPRESSION FREQUENCY

The proposed frequency for conducting dust suppression measures is shown below. The proposed frequency will be reviewed based on performance of the dust suppression measures.

**Table 5: Proposed Frequency for Dust Suppression.**

| SUPPRESSION MEASURE | PROPOSED FREQUENCY |
|---|---|
| Watering of site roads exposed to traffic movement. | As necessary; at least twice every operating day. |
| Covering of loads. | Every truck entering and leaving the premises. |
| Wetting down of exposed landfill surfaces. | As necessary; at least twice every operating day. |

## 3.6 TRIGGER LEVELS

Three trigger conditions are proposed for the commencement of dust management and cessation of dust generation activities.

The first trigger to action dust management measures will be generation of visual dust.

The second trigger for the facility to cease its activities is when strong winds are forecast by the Bureau of Meteorology (in the range of 26 to 33 knots). Work will be reduced in the presence of strong winds and low humidity until a time when conditions become more favourable. If any dust is observed leaving the property boundary then work will cease immediately, the cause of thereof will be investigated and actions will be taken to resolve the problem before regular site activity recommences.

The third trigger pertains to the measurement of particulate matter as $PM_{10}$. The maximum allowable ambient concentration of $PM_{10}$ as stipulated in the *National Environment Protection Measure for Ambient Air Quality* (the *Air NEPM*) is 50 µg/m$^3$ averaged over a 24-hour period. It is proposed to cease all dust-generating operations as soon as any of the light-scatter aerosol monitors detect a $PM_{10}$ concentration above 50 µg/m$^3$. This will allow for the dispersal of the particulate matter that triggered the high reading. Operations will only recommence once the $PM_{10}$ concentration of the ambient air has reduced to less than 25 µg/m$^3$.

## 3.7 REPORTING

Reporting will occur by submitting a complete copy of any records of complaints registered with the Annual Audit Compliance Report and will include:

- Date and time of complaint,
- Locations from which the problem arose,
- Wind direction, speed and atmospheric temperature at the time of the complaint, and
- For any incidents of large amounts of dust, an investigation as to why it occurred and measures taken to resolve the issue.

## 3.8 PROCEDURES TO FOLLOW DURING A COMPLAINT

The following procedures will be followed to record and act upon receiving a complaint due to dust generation:

- Site Supervisor to fill out the complaint register and record the prevailing weather conditions,
- Complaint register to me maintained and made available upon request by the DER or the Shire of York,
- Evaluate the complaint by conducting a visual inspection at the earliest opportunity,

- Upon assessing the nature of compliant to be valid, undertake necessary action to identify the source of dust generation affecting the complainant,
- Take measures as stated in the Dust Management Plan to address the issue,
- Record the action undertaken to address the issue and state the reason for occurrence of dust generation,
- Contact the complainant and inform the findings and agree on the outcome, and
- Report to the DER on the dust complaint/s within the Annual Audit Compliance Report for the facility.

# 4 RISK ASSESSMENT

Table 1 **Qualitative measures of likelihood**

| Rating | Indicator | Description | Frequency |
|---|---|---|---|
| 5 | Almost certain | Multiple incidents have been recorded | Is expected to occur almost all of the time |
| 4 | Likely | Several incidents have been recorded | Is expected to occur most of the time |
| 3 | Probable | Some incidents have been recorded | Might occur |
| 2 | Not likely | Few recorded or known incidents | Might occur but not expected to |
| 1 | Rare | No recorded or known incidents | Only expected to occur under atypical conditions |

Table 2 **Qualitative measures of consequence/impact**

| Rating | Indicator | Description |
|---|---|---|
| 5 | Severe | Human deaths, operations cause catastrophic off-site impacts, immense financial loss |
| 4 | Significant | Extensive human injuries or illness, operations cause substantial off-site impacts, major financial loss |
| 3 | Medium | Some health impacts to humans, operations cause some external impacts, large financial loss |
| 2 | Minor | First aid treatment, operations cause minimal off-site impacts, small financial loss |
| 1 | Negligible | Operations cause no injuries, negligible off-site impacts, and negligible financial loss |

Table 3 **Qualitative risk analysis matrix – Level of risk**

| Consequence | Likelihood | | | | |
|---|---|---|---|---|---|
| | Almost certain | Likely | Probable | Not likely | Rare |
| Severe | V | V | V | V | H |
| Significant | V | V | V | H | H |
| Medium | V | H | H | M | M |
| Minor | H | H | M | L | L |
| Negligible | H | M | L | L | L |

V = Very high risk; immediate action required

H = High risk; management required from senior staff

M = Medium risk; specify required management

L = Low risk; manage with standard operating procedure

| Operational Element | Description of Risk | Potential Impacts | Likelihood / Frequency | Consequence Severity Rating | Level of risk | Control Measures |
|---|---|---|---|---|---|---|
| **General** | | | | | | |
| General | Dust emissions beyond property boundary. | Visual spoiling of clean surfaces, coating of plants with dust, nuisance to surrounding properties, general reduction in amenity. | 2 | 1 | Low | Large buffer distance between operations area and site boundary.<br>Selected roads will be sealed.<br>Specific and dedicated areas for stockpiles.<br>Unsealed roads, exposed areas and stockpiles will be watered down as required.<br>All loads to be covered.<br>Speed limits in place on all internal roads.<br>Mud shaker in place to be utilised by all vehicles leaving the facility.<br>Traffic to travel on designated roads only. |
| General | Dust inhalation by site staff. | Adverse respiratory health effects. | 2 | 3 | Medium | All staff will be provided with dust masks.<br>Rigorous checking of every load that enters the facility.<br>Loads to be wet down during tipping, as required.<br>All staff to be made familiar with dust suppression measures. |

# 5 SUMMARY OF DUST MANAGEMENT PLAN

The summary of the Dust Management Plan is given in **Table 6**.

**Table 6: Summary of Dust Management Plan**

| ACTIVITY | POTENTIAL RISK | DUST MINIMISATION PROCEDURE |
|---|---|---|
| **Construction** | | |
| Earthworks | Low – Two months | Removal of top soils and grading of land will be undertaken with application of water to reduce dust generation. |
| Stockpiling | Low | The stockpiled top soil will be wetted down during high wind conditions. |
| Traffic | Low – Minimum traffic | Number of vehicles accessing the site will be minimal during construction. Visual dust monitoring will be undertaken and areas generating dust will be watered down. |
| **Operation** | | |
| Material Haulage | Medium | Visual monitoring will be undertaken regularly by site staff, truck drivers and other road users. Wetting down of road will be done at least twice every operating day. |
| Spillage | Low | The trucks carting waste to the facility will be covered. Any spillage will be cleaned immediately. |
| Litter | Low | Any litter within the premises will be collected daily. |
| Exposed Stockpiles | Low | Dry stockpiles arriving at the site will be wetted down and will have higher priority to be incorporated into the landfill. |
| Strong Wind Conditions | Medium | Cease all activities having potential to generate dust when strong winds are experienced. |
| Depositing waste in landfill. | Medium | Active face to be wetted down during the deposition of waste, as required. |
| Internal Traffic Movement | Low | The roads within the premises will be wetted down to limit the dust generated due to vehicle and plant traffic. |

## 5.1 PREDICTED OUTCOME

It is considered that the measures identified above will reduce and control the instances of dust generation. Given the adequate buffer distance to a sensitive premise and surrounding vegetation, along with the implementation of the measures identified to reduce or control dust, it is believed that dust emissions can be managed to meet the EPA's objective.

# 6 REFERENCES

Department of Environment and Conservation, 2011. A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities.

Environmental Protection Authority, 2010. Environmental Protection (Noise) Regulations 1997 (As Amended).

Environmental Protection Authority, 2005. Guidance Statement No 3, Separation Distance between Industrial and Sensitive Land Uses.

National Environment Protection Council, 1998. National Environment Protection Measure for Ambient Air Quality.

Standards Australia, 2007. Methods for sampling and analysis of ambient air – Guide to siting monitoring equipment, AS/NZS 3580.1.1:2007, Standards Australia, NSW.

West Australian State Government, 1984. Occupational Safety and Health Act.

Western Australian State Government, 1996. National Environment Protection Council (Western Australia) Act.

# 7 APPENDICES

blank page

Appendix A Complaint Register

| Date | Time | Person | Contact Details | Incident Description | Incident Location | Weather Conditions | Action Taken | Follow-up Action Required |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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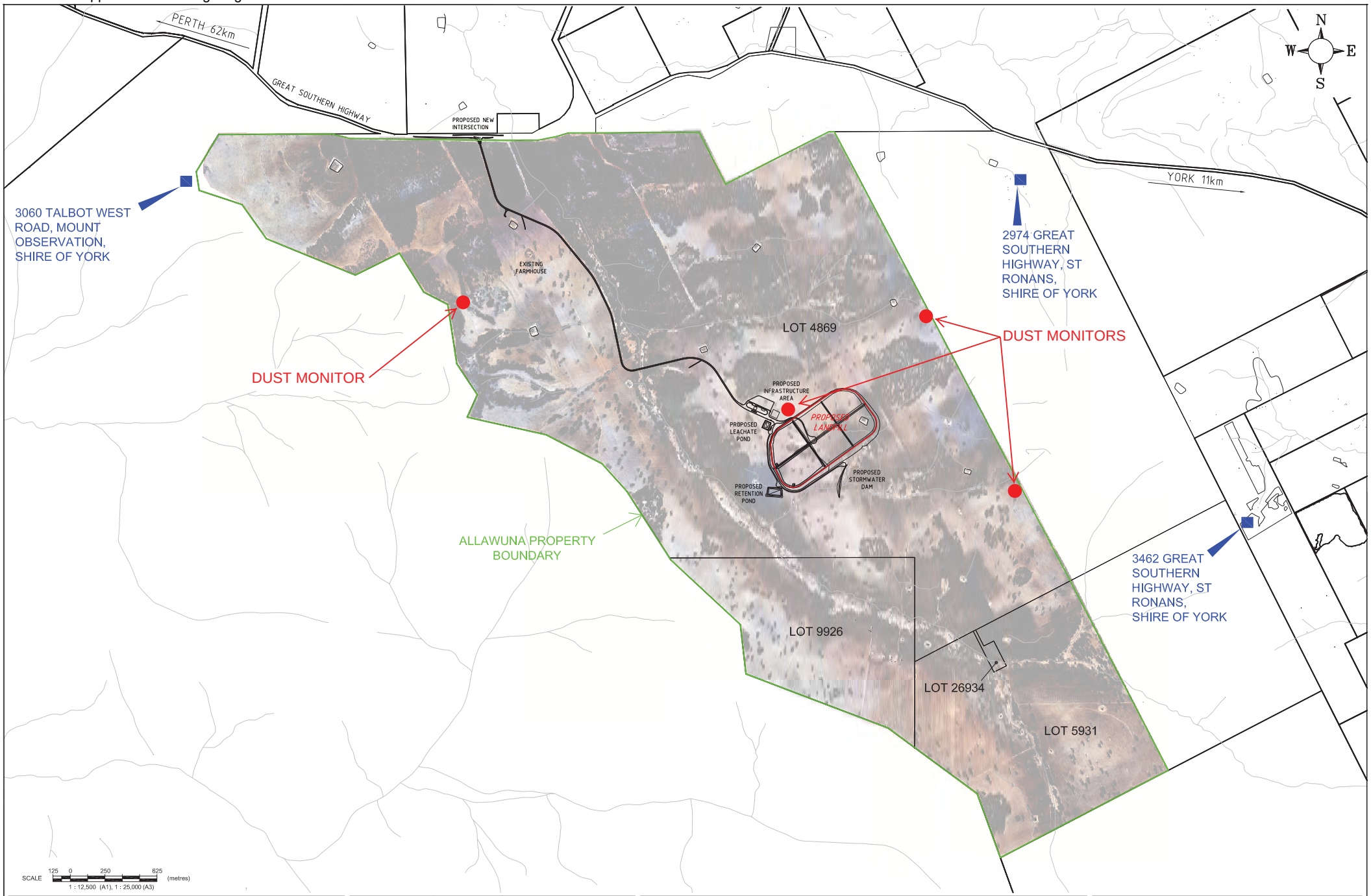
| | | | | | | | | |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bowman and Associates Pty Ltd<br>ABN: 22 112 399 514<br>Mail: PO Box 2059, Rossmoyne WA 6148<br>Office: 8/640 Beeliar Drive, Success WA 6164<br>Phone: (08) 9414 9670<br>Web: www.bowmanassociates.com.au | Client: SITA Australia | Location: Lots 4869, 5931, 9926 & 26934 Great Southern Hwy, Saint Ronans | | | | Drawing Title: Site Plan and Location | |
| | Date: 04/03/15 | Scale: 1:12,500 | Design By: B.W.B. | Drawn By: S.B.Y. | Project: Allawuna Farm Landfill | Drawing Number: Figure 1 | Revision: A / Drawing Size: A1 |

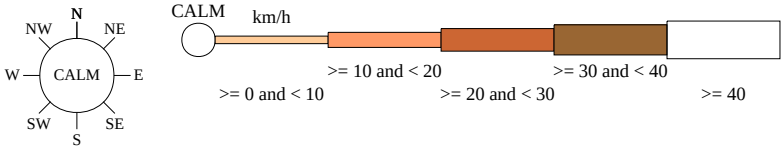
# Rose of Wind direction versus Wind speed in km/h (13 May 1996 to 30 Sep 2010)

Custom times selected, refer to attached note for details

## YORK

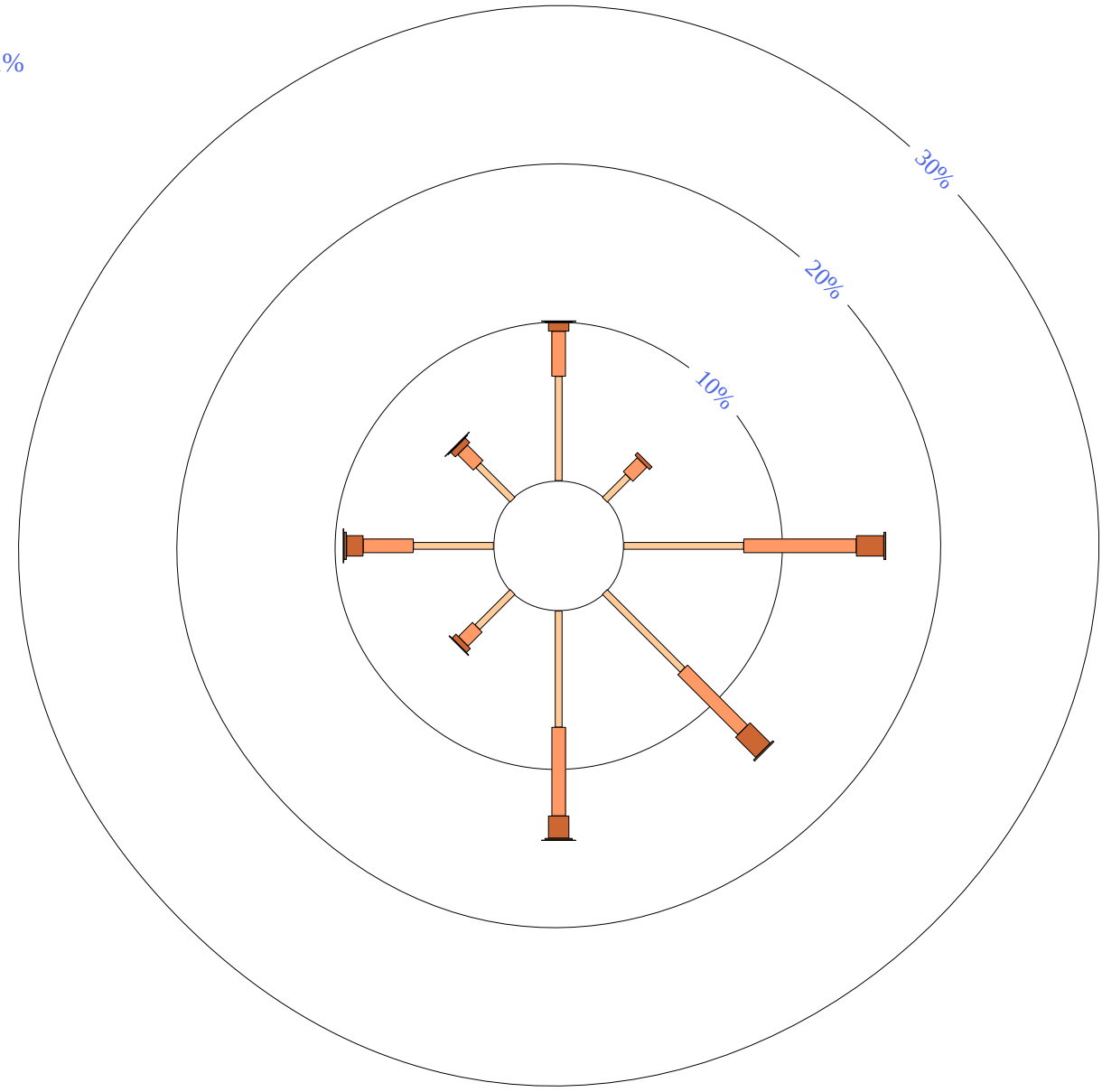
Site No: 010311 • Opened Apr 1996 • Still Open • Latitude: -31.8997° • Longitude: 116.765° • Elevation 179m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.




9 am
5134 Total Observations

Calm 21%




Australian Government
Bureau of Meteorology

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*Prepared by National Climate Centre of the Bureau of Meteorology.*
*Contact us by phone on (03) 9669 4082, by fax on (03) 9669 4515, or by email on climatedata@bom.gov.au*
*We have taken all due care but cannot provide any warranty nor accept any liability for this information.*

# Rose of Wind direction versus Wind speed in km/h (13 May 1996 to 30 Sep 2010)

Custom times selected, refer to attached note for details

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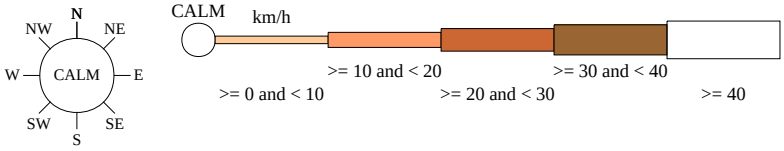
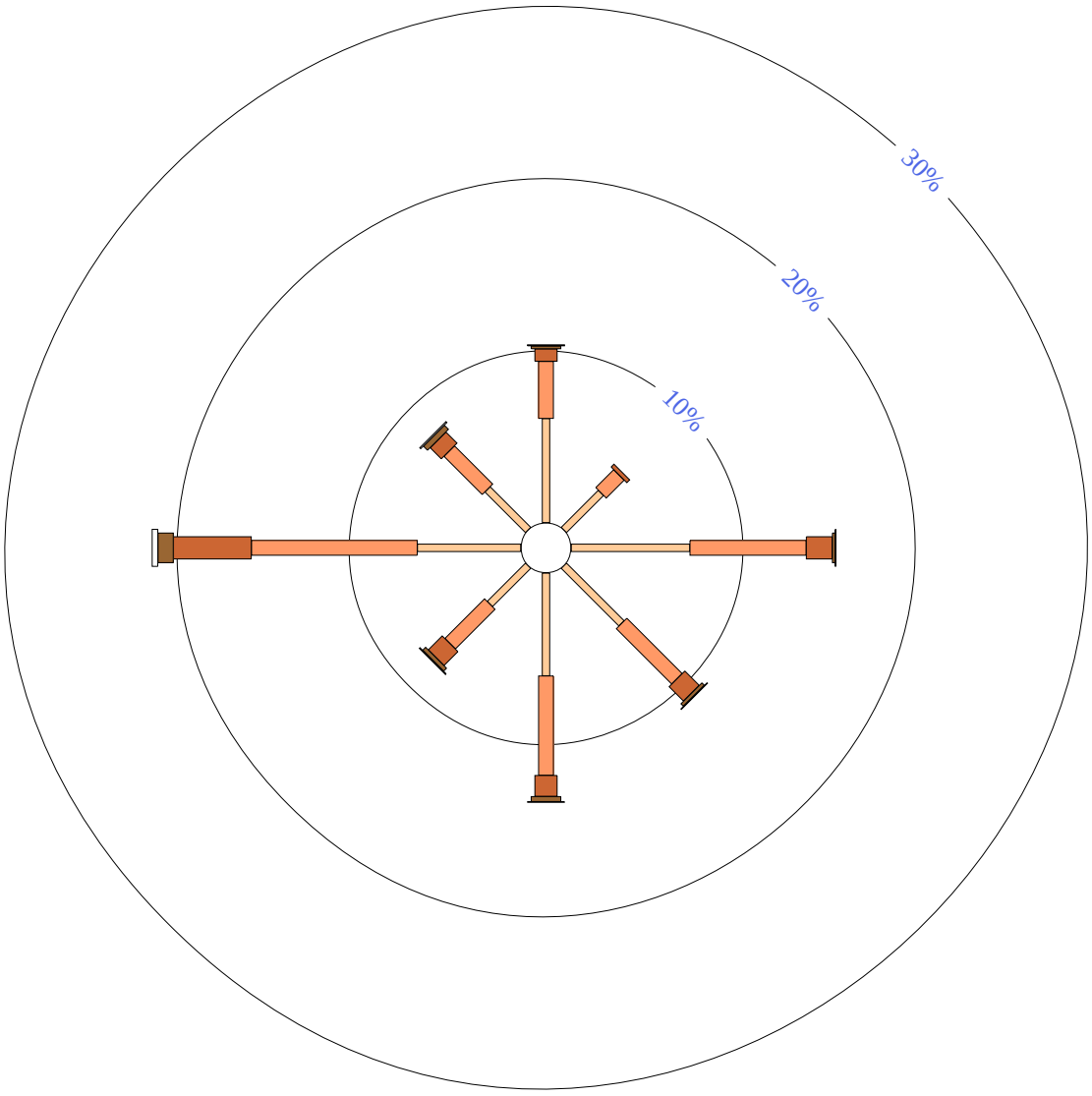



3 pm
5116 Total Observations

Calm 7%

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*Prepared by National Climate Centre of the Bureau of Meteorology.*
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*We have taken all due care but cannot provide any warranty nor accept any liability for this information.*

## ATTACHMENT G

**Landfill Gas Modelling Values**

## ProjectDetails

| | |
|---|---|
| Project Name | Allawuna |
| Client | SITA |
| Model | j:\env\2015\sita allawuna wa\allawah option 2.gss |
| Model Date | 2/02/2015 4:26:18 PM |
| Comments | |
| Start Year | 2020 |
| Operation Period | 22 |
| Simulation Period | 150 |
| Iterations | 100 |

Confined Migration Pathway

## Waste Composition

| Year | Composition |
|---|---|
| **2020** | Allawuna |
| *Newspapers* | |
| Domestic | SINGLE(13.0) |
| Commercial | SINGLE(15.5) |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(48.5) |
| Hemi-Cellulose (%) | SINGLE(9.0) |
| Decomposition (%) | SINGLE(35.0) |
| *Magazines* | |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(42.3) |
| Hemi-Cellulose (%) | SINGLE(9.4) |
| Decomposition (%) | SINGLE(46.0) |
| *Other paper* | |
| Civic Amenity | SINGLE(3.3) |
| Industrial | SINGLE(8.8) |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(87.4) |
| Hemi-Cellulose (%) | SINGLE(8.4) |
| Decomposition (%) | SINGLE(98.0) |
| *Liquid cartons* | |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(57.3) |
| Hemi-Cellulose (%) | SINGLE(9.9) |
| Decomposition (%) | SINGLE(64.0) |
| *Card packaging* | |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(57.3) |
| Hemi-Cellulose (%) | SINGLE(9.9) |
| Decomposition (%) | SINGLE(64.0) |
| *Other card* | |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | SINGLE(57.3) |
| Hemi-Cellulose (%) | SINGLE(9.9) |
| Decomposition (%) | SINGLE(64.0) |
| *Wood* | |
| Domestic | SINGLE(1.0) |
| Civic Amenity | SINGLE(11.2) |
| Commercial | SINGLE(12.5) |
| Industrial | SINGLE(5.0) |
| Water (%) | SINGLE(20.0) |
| Cellulose (%) | SINGLE(21.0) |
| Hemi-Cellulose (%) | SINGLE(11.0) |
| Decomposition (%) | SINGLE(75.0) |
| *Textiles* | |
| Domestic | SINGLE(1.5) |
| Civic Amenity | SINGLE(2.3) |
| Commercial | SINGLE(4.0) |
| Industrial | SINGLE(0.3) |
| Water (%) | SINGLE(25.0) |
| Cellulose (%) | SINGLE(20.0) |
| Hemi-Cellulose (%) | SINGLE(20.0) |
| Decomposition (%) | SINGLE(50.0) |
| *Disposable nappies* | |
| Domestic | SINGLE(4.0) |
| Civic Amenity | SINGLE(2.9) |
| Water (%) | SINGLE(20.0) |
| Cellulose (%) | SINGLE(25.0) |
| Hemi-Cellulose (%) | SINGLE(25.0) |
| Decomposition (%) | SINGLE(50.0) |
| *Other misc. combustibles* | |
| Domestic | SINGLE(1.0) |
| Civic Amenity | SINGLE(4.2) |
| Commercial | SINGLE(3.5) |
| Industrial | SINGLE(17.7) |
| Water (%) | SINGLE(20.0) |
| Cellulose (%) | SINGLE(25.0) |
| Hemi-Cellulose (%) | SINGLE(25.0) |
| Decomposition (%) | SINGLE(50.0) |

| | |
|---|---|
| *Garden waste* | |
| Domestic | SINGLE(16.5) |
| Civic Amenity | SINGLE(32.1) |
| Commercial | SINGLE(4.0) |
| Industrial | SINGLE(4.7) |
| Water (%) | SINGLE(65.0) |
| Cellulose (%) | SINGLE(25.7) |
| Hemi-Cellulose (%) | SINGLE(13.0) |
| Decomposition (%) | SINGLE(62.0) |
| *Other putrescible* | |
| Domestic | SINGLE(35.0) |
| Civic Amenity | SINGLE(14.8) |
| Commercial | SINGLE(21.5) |
| Industrial | SINGLE(6.8) |
| Water (%) | SINGLE(65.0) |
| Cellulose (%) | SINGLE(55.4) |
| Hemi-Cellulose (%) | SINGLE(7.2) |
| Decomposition (%) | SINGLE(76.0) |
| *10mm fines* | |
| Civic Amenity | SINGLE(1.2) |
| Industrial | SINGLE(0.5) |
| Water (%) | SINGLE(40.0) |
| Cellulose (%) | SINGLE(25.0) |
| Hemi-Cellulose (%) | SINGLE(25.0) |
| Decomposition (%) | SINGLE(50.0) |
| *Sewage sludge* | |
| Commercial | SINGLE(1.5) |
| Sewage Sludge | SINGLE(100.0) |
| Water (%) | SINGLE(70.0) |
| Cellulose (%) | SINGLE(14.0) |
| Hemi-Cellulose (%) | SINGLE(14.0) |
| Decomposition (%) | SINGLE(75.0) |
| *Composted organic material* | |
| Composted Organic Material | SINGLE(100.0) |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | UNIFORM(7.47, 9.59) |
| Hemi-Cellulose (%) | UNIFORM(7.47, 9.59) |
| Decomposition (%) | SINGLE(57.0) |
| *Incinerator ash* | |
| Industrial | SINGLE(25.5) |
| Incinerator Ash | SINGLE(100.0) |
| Water (%) | SINGLE(30.0) |
| Cellulose (%) | TRIANGULAR(0.5, 0.7, 1.5) |
| Hemi-Cellulose (%) | TRIANGULAR(0.5, 0.7, 1.5) |
| Decomposition (%) | SINGLE(57.0) |
| *Non degradable* | |
| Domestic | SINGLE(28.0) |
| Civic Amenity | SINGLE(28.0) |
| Commercial | SINGLE(37.5) |
| Industrial | SINGLE(30.7) |
| Inert | SINGLE(100.0) |
| Water (%) | SINGLE(0.0) |
| Cellulose (%) | SINGLE(0.0) |
| Hemi-Cellulose (%) | SINGLE(0.0) |
| Decomposition (%) | SINGLE(0.0) |
| *Calcium Sulphate (%)* | |
| Domestic | TRIANGULAR(0.2, 0.35, 2.3) |
| Civic Amenity | TRIANGULAR(0.2, 0.35, 2.3) |
| Composted Organic Material | TRIANGULAR(0.2, 0.35, 2.3) |
| Incinerator Ash | TRIANGULAR(0.2, 0.35, 2.3) |
| Residues from MRF | TRIANGULAR(0.2, 0.35, 2.3) |
| Recycling Schemes | TRIANGULAR(0.2, 0.35, 2.3) |
| Chemical Sludge | TRIANGULAR(0.2, 0.35, 2.3) |
| Industrial Liquid Waste | TRIANGULAR(0.2, 0.35, 2.3) |
| *Iron (%)* | |
| Domestic | TRIANGULAR(0.3, 4.8, 8.2) |
| Civic Amenity | TRIANGULAR(0.3, 4.8, 8.2) |
| Commercial | TRIANGULAR(0.3, 4.8, 8.2) |
| Industrial | TRIANGULAR(0.3, 4.8, 8.2) |
| Inert | TRIANGULAR(0.3, 4.8, 8.2) |
| Liquid Inert | TRIANGULAR(0.3, 4.8, 8.2) |
| Sewage Sludge | TRIANGULAR(0.3, 4.8, 8.2) |
| Composted Organic Material | TRIANGULAR(0.3, 4.8, 8.2) |
| Incinerator Ash | TRIANGULAR(0.3, 4.8, 8.2) |
| Residues from MRF | TRIANGULAR(0.3, 4.8, 8.2) |
| Recycling Schemes | TRIANGULAR(0.3, 4.8, 8.2) |
| Chemical Sludge | TRIANGULAR(0.3, 4.8, 8.2) |
| Industrial Liquid Waste | TRIANGULAR(0.3, 4.8, 8.2) |
| User Defined 1 | TRIANGULAR(0.3, 4.8, 8.2) |
| User Defined 2 | TRIANGULAR(0.3, 4.8, 8.2) |
| User Defined 3 | TRIANGULAR(0.3, 4.8, 8.2) |
| **2021** | Allawuna |
| **2022** | Allawuna |
| **2023** | Allawuna |
| **2024** | Allawuna |
| **2025** | Allawuna |

| | | |
|---|---|---|
| **2026** | | Allawuna |
| **2027** | | Allawuna |
| **2028** | | Allawuna |
| **2029** | | Allawuna |
| **2030** | | Allawuna |
| **2031** | | Allawuna |
| **2032** | | Allawuna |
| **2033** | | Allawuna |
| **2034** | | Allawuna |
| **2035** | | Allawuna |
| **2036** | | Allawuna |
| **2037** | | Allawuna |
| **2038** | | Allawuna |
| **2039** | | Allawuna |
| **2040** | | Allawuna |
| **2041** | | Allawuna |
| Justification: | [Default] | Default Value |

## Trace Gases

No Combustion Products Selected

## Landfill Cells

| | | |
|---|---|---|
| Infiltration | | TRIANGULAR(100.0, 200.0, 300.0) |
| Justification: | [Changed] | Not Justified |

## Waste Input

| Year | AmountDepositied (t) |
|---|---|
| 2020 | UNIFORM(2.25E+05, 2.75E+05) |
| 2021 | UNIFORM(2.25E+05, 2.75E+05) |
| 2022 | UNIFORM(2.25E+05, 2.75E+05) |
| 2023 | UNIFORM(2.25E+05, 2.75E+05) |
| 2024 | UNIFORM(2.25E+05, 2.75E+05) |
| 2025 | UNIFORM(2.25E+05, 2.75E+05) |
| 2026 | UNIFORM(2.25E+05, 2.75E+05) |
| 2027 | UNIFORM(2.25E+05, 2.75E+05) |
| 2028 | UNIFORM(2.25E+05, 2.75E+05) |
| 2029 | UNIFORM(2.25E+05, 2.75E+05) |
| 2030 | UNIFORM(2.25E+05, 2.75E+05) |
| 2031 | UNIFORM(2.25E+05, 2.75E+05) |
| 2032 | UNIFORM(2.25E+05, 2.75E+05) |
| 2033 | UNIFORM(2.25E+05, 2.75E+05) |
| 2034 | UNIFORM(2.25E+05, 2.75E+05) |
| 2035 | UNIFORM(2.25E+05, 2.75E+05) |
| 2036 | UNIFORM(2.25E+05, 2.75E+05) |
| 2037 | UNIFORM(2.25E+05, 2.75E+05) |
| 2038 | UNIFORM(2.25E+05, 2.75E+05) |
| 2039 | UNIFORM(2.25E+05, 2.75E+05) |
| 2040 | UNIFORM(2.25E+05, 2.75E+05) |
| 2041 | UNIFORM(2.25E+05, 2.75E+05) |
| Justification: [Changed] | Not Justified |

## Waste Breakdown

| | |
|---|---|
| **2020** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2021** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2022** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2023** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2024** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2025** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2026** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2027** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2028** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2029** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2030** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | TRIANGULAR(45.0, 50.0, 55.0) |
| **2031** | |
| Domestic | TRIANGULAR(45.0, 50.0, 55.0) |

| | | |
|---|---|---|
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2032** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2033** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2034** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2035** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2036** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2037** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2038** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2039** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2040** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| **2041** | | |
| Domestic | | TRIANGULAR(45.0, 50.0, 55.0) |
| Commercial | | TRIANGULAR(45.0, 50.0, 55.0) |
| Justification: | [Default] | Default Value |

## Trace Gases

No Trace Gases Selected

## Waste Moisture Content

| | | |
|---|---|---|
| Degradation rate - Filling Phase | | Average |
| Justification: | [Default] | Default Value |
| Degradation rate - after change | | Average |
| Justification: | [Default] | Default Value |
| Waste Density | | UNIFORM(0.8, 1.2) |
| Justification: | [Default] | Default Value |
| Leachate Head | | SINGLE(1.0) |
| Justification: | [Default] | Default Value |
| Hydraulic Conductivity | | LOGUNIFORM(1.00E-09, 1.00E-05) |
| Justification: | [Default] | Default Value |

## Engineered Controls

| | | |
|---|---|---|
| *Cap* | | None |
| Justifications | | |
| Cap | [Default] | Default Value |
| Cap Thickness | [Changed] | Not Justified |
| Cap Hydraulic Conductivity | [Changed] | Not Justified |
| *liner* | | None |
| Justifications | | |
| Liner | [Default] | Default Value |
| Liner Thickness | [Changed] | Not Justified |
| Liner Hydraulic Conductivit | [Changed] | Not Justified |
| Justification: | [Default] | Default Value |
| Methane Oxidation % | | SINGLE(10.0) |
| Justification: | [Default] | Default Value |
| Land Raise Depth | | #UNDEFINED? |

## Geosphere

| | |
|---|---|
| Ground Surface (mAOD) | 0 |
| Water Table (mAOD) | 0 |
| Geosphere Moisture Content | SINGLE(35.0) |
| Geosphere Porosity | SINGLE(10.0) |

## Site Characteristics

| | | |
|---|---|---|
| Proportion to CO2 [%] | | SINGLE(50.0) |
| Justification: | [Default] | Default Value |
| Proportion to CH4 [%] | | SINGLE(50.0) |
| Justification: | [Default] | Default Value |

## Cellulose Decay Rates

| | | Slow | Moderate | Fast |
|---|---|---|---|---|
| Dry | | UNIFORM(0.013, 0.046) | UNIFORM(0.046, 0.076) | SINGLE(0.076) |
| Average | | UNIFORM(0.013, 0.046) | UNIFORM(0.013, 0.046) | SINGLE(0.076) |
| Wet | | SINGLE(0.076) | SINGLE(0.116) | SINGLE(0.694) |
| Saturated | | SINGLE(0.013) | SINGLE(0.046) | SINGLE(0.076) |
| User Defined 1 | | SINGLE(0.046) | UNIFORM(0.046, 0.076) | UNIFORM(0.076, 0.116) |
| User Defined 2 | | UNIFORM(0.046, 0.076) | UNIFORM(0.076, 0.116) | UNIFORM(0.116, 0.694) |
| Justification: | [Changed] | Not Justified | | |

## Gas Plant

| | | |
|---|---|---|
| *Engine* | | Spark Ignition Engine |
| January 2021 to December 2060 | | 200 to 1500 Downtime [%]: UNIFORM(3.0, 5.0) |

| | | | |
|---|---|---|---|
| Justification: | [Changed] | Not Justified | |
| Destruction Efficiency CH4 | [Changed] | Not Justified | |
| Destruction Efficiency H2 | [Changed] | Not Justified | |
| Properties | [Changed] | Not Justified | |
| *Engine* | | Spark Ignition Engine | |
| January 2021 to December 2060 | | 200 to 1500 | Downtime [%]: UNIFORM(3.0, 5.0) |
| Justification: | [Changed] | Not Justified | |
| Destruction Efficiency CH4 | [Changed] | Not Justified | |
| Destruction Efficiency H2 | [Changed] | Not Justified | |
| Properties | [Changed] | Not Justified | |
| Engine/Flare Order | [Changed] | Not Justified | |

## Trace Gas Plant

| | | |
|---|---|---|
| | | No Trace Gases Selected |
| Justification: | [Default] | Default Value |

## Global Impact

**Bulk Gases**

| | | |
|---|---|---|
| Global Warming Potential | | |
| Carbon Dioxide [t]: | | 1 |
| Methane [t carbon dioxoide]: | | 21 |
| Hydrogen [t carbon dioxide]: | | 0 |
| Justification: | [Default] | Default Value |
| Ozone Depletion Potential | | |
| Carbon Dioxide [t trichlorofluoromethane]: | | 0 |
| Methane [t trichlorofluoromethane]: | | 0 |
| Hydrogen [t trichlorofluoromethane]: | | 0 |
| Justification: | [Default] | Default Value |

## Lateral Migration

**Bulk Gases**

| | | |
|---|---|---|
| Air Diffusion Coefficients | | |
| CO2 Dispersivity | | SINGLE(0.1613) |
| CH4 Dispersivity | | SINGLE(0.2192) |
| H2 Dispersivity | | #UNDEFINED? |
| Justification: | [Default] | Default Value |

**Geosphere**

| | | |
|---|---|---|
| *Cell* | | Landfill Cells |
| Geosphere Moisture Content | | SINGLE(35.0) |
| Geosphere Porosity | | SINGLE(10.0) |
| Justification: | [Changed] | Not Justified |

## ATTACHMENT H

**Noise Management Plan**


THE LEADER IN RESOURCE RECOVERY

# ALLAWUNA FARM LANDFILL – NOISE MANAGEMENT PLAN

This report describes the noise management measures proposed for the landfill facility at Allawuna Farm in the Shire of York.

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| 2 | 3/07/15 | Stefan Berger | Bruce Bowman | |
| | | | | |
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## DOCUMENT DISTRIBUTION

| VERSION | TYPE | FORMAT | ISSUED TO | ORGANISATION |
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| 2 | PDF | electronic | John Jones | SITA Australia Pty Ltd |
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## FILE NAME

150703 SB Allawuna Noise Mgmt Plan

blank page

## TABLE OF CONTENTS

## FIGURES



## TABLES



## ACRONYMS

| | |
|---|---|
| EPA | Environmental Protection Authority |
| VIPAC | VIPAC Engineers and Scientists |
| WA | Western Australia |
| DAFWA | Department of Agriculture of Food Western Australia |
| RAV | Restricted Access Vehicle |
| BPEM | Best Practice Environmental Management |
| EPNR | Environmental Protection (Noise) Regulations |

## UNITS OF MEASURE

| | |
|---|---|
| dB(A) | Decibel at a Location |
| km | Kilometre |
| m | Metre |
| mm | Millimetre |

# 1 PRELIMINARIES

## 1.1 SITA AUSTRALIA

SITA Australia (SITA) wishes to develop a landfill facility in the Shire of York. The proposed facility will be located on Allawuna Farm, Saint Ronans, the location of which is shown below. The local site location is shown in **Figure 1**. It is proposed that this facility would receive putrescible waste, clean fill, Type I & II Inert Waste, contaminated solid waste[1] and Type I & II Special Waste. The facility will accept up to 250,000 tonnes of waste annually.

**Figure 1: Landfill location.**


This noise management plan outlines the measures that will be put in place to ensure that the surrounding community and SITA employees do not suffer from a loss of amenity due to noise emissions originating from within the proposed site.

## 1.2 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a standard set of instructions and procedures that will be adopted during the operation of the landfill facility owned by SITA. All staff at the facility are expected to understand and follow the procedures outlined.

## 1.3 LOCATION

The site is located on the southern side of Great Southern Highway approximately 80 km by road from Perth and 20 km by road from York. The landfill will occupy a portion of Lot 4869 Great Southern Highway, Saint Ronans. The site is located east of the Swan Coastal Plain, in the Darling Scarp. The site was selected as the optimal choice after an investigation of nineteen potential sites undertaken by SITA.

## 1.4 NEAREST RECEPTORS AND BUFFER DISTANCES

The Environment and Protection Authority's (EPA) Guidance Statement No 3, *Separation Distance between Industrial and Sensitive Land Uses,* recommends a buffer distance of 150 metres between a Class II or III landfill and a single residence. The distance between the proposal and the nearest single residence is 1,900 metres. The Guidance Statement also recommends a buffer distance of 35 metres

[1] Meeting waste acceptance criteria specified for Class II landfills.

between a Class II or III landfill and the boundary of the property on which it is located. The proposed facility is located 600 metres from the Allawuna Farm's property boundary. **Table 1** provides a summary of the relevant buffer distances.

**Table 1: Buffer Distances**

| DESCRIPTION | BUFFER DISTANCE (m) |
|---|---|
| Minimum DER requirement for sensitive receptor land use from putrescible landfill | 500 |
| Minimum DER requirement for single residence from putrescible landfill | 150 |
| Proposed landfill to Lot Boundary | 600 |
| Proposed landfill to nearest neighbouring dwelling (single residence) | 1,900 |
| Proposed landfill to Mount Observation picnic area | 4,600 |
| Proposed landfill to Wandoo National Park | 1,000 |
| Proposed leachate dams to Thirteen Mile Brook | 270 |
| Proposed landfill to Thirteen Mile Brook | 350 |

## 1.5 CLOSEST RESIDENCE

The closest residence to the property is approximately 1.9 km to the north-east of the landfill. The next closest residence is situated 2.4 km from the proposed facility. These distances were measured using Google Earth and are an approximate only. No residences have a direct line of sight to the proposed site; all are screened by vegetation and sloping hills due to the topography of the landscape.

## 1.6 SURROUNDING LAND USES

Two properties in the vicinity of Allawuna Farm have been identified in the DAFWA sensitive sites database. One is listed as a bio-dynamic site and the other as an organic site. The property boundary of the bio-dynamic site is approximately 700 m from the Allawuna Farm property boundary and 2.5 km from the proposed landfill footprint. The organic site is approximately 1.3 km from the Allawuna Farm property boundary and 2.0 km from the proposed landfill footprint.

Given the relatively large buffer distances between these properties and the proposed landfill and the planned management strategies for potential emissions originating from the landfill, the proposed development is expected to have no impact on either of the sensitive surrounding land uses identified.

## 2 ASSIGNED OUTDOOR NOISE LEVELS

**Table 2** shows the maximum noise levels for various types of premises in accordance with the *Environmental Protection (Noise) Regulations 1997 (as amended)* (the Regulations). The applicable type of receiving premises for the proposed development is "noise sensitive premises (0700 to 1900 hours Monday to Saturday)".

**Table 2: Assigned Outdoor Noise Levels**

| Type of premises receiving noise | Time of day | Assigned level (dB) | | |
|---|---|---|---|---|
| | | $L_{A10}$ | $L_{A1}$ | $L_{A\ max}$ |
| Noise sensitive premises: highly sensitive area (ie within 15 m of a dwelling) | 0700 to 1900 hours Monday to Saturday | 45 + IF | 55 + IF | 65 + IF |
| | 0900 to 1900 hours Sunday and public holidays | 40 + IF | 50 + IF | 65 + IF |
| | 1900 to 2200 hours all days | 40 + IF | 50 + IF | 55 + IF |
| | 2200 hours any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays | 35 + IF | 45 + IF | 55 + IF |
| Noise sensitive premises: any area other than highly sensitive area | All hours | 60 | 75 | 80 |
| Commercial premises | All hours | 60 | 75 | 80 |
| Industrial and utility premises other than those in the Kwinana Industrial Area | All hours | 65 | 80 | 90 |
| Industrial and utility premises in the Kwinana Industrial Area | All hours | 75 | 85 | 90 |

Note: The $L_{A10}$ noise level is the noise that is exceeded for 10% of the time.
The $L_{A1}$ noise level is the noise that is exceeded for 1% of the time.
The $L_{Amax}$ noise level is the maximum noise level recorded.
IF = Influencing Factor

The Regulations also require noise emissions from the site to be free of annoying characteristics (tonality, modulation and impulsiveness). The use of diesel-powered heavy equipment may result in tonal characteristics in the emitted noise, and as such an influencing factor of +5 dB (A) will need to be applied to the receivers' predicted noise level.

# 3 LANDFILL OPERATIONS

## 3.1 OPERATING SCHEDULE

It is proposed that the facility will operate from 6 am to 5 pm Monday to Friday and from 6 am to 4 pm on Saturdays. The Saturday schedule will be followed for public holidays but the site will remain closed for New Year's Day, Good Friday and Christmas Day.

## 3.2 QUALITY CERTIFICATION

SITA has a certified system for the management of the Environment (ISO 14001), Health and Safety (AS 4801) and Quality (ISO 9001). The management processes at Allawuna Farm Landfill will tie into these certified systems.

## 3.3 LOGISTICS AND TRAFFIC VOLUME

The development of the Allawuna Farm Landfill will generate road train vehicle movements between SITA's waste transfer stations in Welshpool and Landsdale and the landfill site. The development will eliminate the current transfer vehicle movement to the Shale Road Landfill on South Western Highway.

The transfer road trains will be Restricted Access Vehicles (RAV) Class 2, Category 3 in a pocket road train configuration, with a maximum length of 27.5 m. The pocket road trains will travel along the existing RAV Network 4 road system to the site via Gnangara Road, West Swan Road, Reid Highway, Roe Highway, Great Eastern Highway and Great Southern Highway. The existing RAV Network 4 intersections along the route are all sufficiently developed to accommodate the small increase in road train volume associated with the landfill development. **Figure 2** outlines the route that the waste transfer trucks will take.

**Figure 2: Waste transfer road train routes.**


When operating at maximum capacity one road train will depart the Perth region every 20 minutes for a total of 24 deliveries to the Allawuna Farm Landfill per day. If additional cover material is required for landfill operations up to one additional truck per day carrying recycled brick road base or similar material may also access the site, as is currently the practice at Shale Road Landfill.

The development of the site will have a negligible effect on the road network in the metropolitan area and a minimal impact on Great Southern Highway vehicle volumes. As road train loads are evenly distributed across the day, the impact on peak traffic times is also considered to be negligible.

A comprehensive review of the available traffic data from the Main Roads WA (MRWA) *Traffic Digest* compared with the proposed increase in vehicle movements found the increase in Great Southern Highway vehicle volumes would be less than 3% on 2008/09 volumes.

A small number of light vehicle movements for facility staff entering and departing the site in the morning and evening will also occur. The expectation is that most employees will be residents of the York area, with an expected 30-40 vehicle single directional movements a day between York and the site. This volume represents a 2-3% increase in traffic between York and Allawuna.

## 3.4 LANDFILLING

The placement and covering of waste will be in accordance with the Victorian Best Practice Environmental Management (VIC-BPEM) guidelines for landfills. Cover material and internal roads will be made from material excavated during cell construction or waste materials with appropriate properties for vehicle traffic such as builders' rubble, crushed concrete and on the landfill area shredded wood.

The waste will be placed by maintaining one active tipping area that is as small as possible. The landfill will be effectively compacted to minimise long term settlement and maximise the use of the available airspace. The compactor will make three to five passes over waste that has been placed in 500 mm layers. Emplaced waste will be completely covered at the end of each day.

## 3.5 PLANT LIST

The earthmoving plant that will be used in the construction and operation of the landfill are listed in **Table 3**. All of the heavy machinery and mechanical plant used on-site will be fitted with acoustic panels and mufflers (exhaust silencers), as well as broadband alarm reversing beepers.

**Table 3: Plant list.**

| Plant | Quantity |
|---|---|
| Construction | |
| Pad Foot Roller | 1 |
| Smooth Drum Roller | 1 |
| Grader | 1 |
| 30 tonne excavator | 2 |
| Articulated Water Truck | 1 |
| Articulated Dump Truck | 2 |
| D9 Dozer | 1 |
| 50 tonne Loader | 1 |
| Wheel Tractor Scraper | 1 |
| Operation | |
| 30 tonne Compactor | 1 |
| 50 tonne Compactor | 1 |
| D7 Dozer | 1 |
| Dump Truck 6x4 | 1 |
| Excavator | 1 |
| Water Truck 6x4 | 1 |
| Grader | 1 |

# 4 NOISE MANAGEMENT PLAN

## 4.1 OBJECTIVE

The objective of the noise management plan is to minimise any noise generated during the operation and construction of the proposed landfill facility, and be compliant with the *Environmental Protection (Noise) Regulations 1997*.

## 4.2 NOISE IMPACT ASSESSMENT

Noise will arise during the operation of heavy equipment, movement of vehicles and reversing beepers. The *Environmental Protection (Noise) Regulations 1997 (As Amended)* stipulate the allowable noise levels that can be received at any noise sensitive premises as a result of activities occurring on another premise. The objective is to protect the amenity of nearby residents and other land users from noise impacts resulting from activities associated with the proposal by ensuring that noise levels comply with the *Environmental Protection (Noise) Regulations 1997 (As Amended)* (the EPNR). A noise impact assessment (Appendix A) was carried out by VIPAC Engineers & Scientists (VIPAC) in March 2015 on the Lot. The assessment was to determine the impact of the proposed landfill construction and operation on the surrounding receptors.

An extract from the VIPAC report on the predicted noise levels for the nearby sensitive receptors is shown in **Table 4** below. It must be noted that these predictions are for 'worst case' wind conditions where there is a temperature inversion in conjunction with light winds in the direction from source to receiver, resulting in effective sound propagation towards the receiver locations.

**Table 4: Extract from VIPAC noise assessment.**

| **Location 1 – 3060 Talbot West Road, Mount Observation Picnic Area** | | | |
|---|---|---|---|
| | Noise Levels (dBA) | | |
| | $L_{A1}$ | $L_{A10}$ | $L_{Amax}$ |
| Computed Levels | 39 | 35 | 42 |
| Background Levels | 65 | 46 | 70 |
| EPNR Criteria (07:00-19:00, Monday – Saturday) | 55 | 45 | 65 |
| EPNR criteria met? | ✓ | ✓ | ✓ |
| **Location 2 – 2974 Great Southern Highway, St Ronans** | | | |
| | Noise Levels (dBA) | | |
| | $L_{A1}$ | $L_{A1}$ | $L_{A1}$ |
| Computed Levels | 47 | 41 | 52 |
| Background Levels | 65 | 46 | 70 |
| EPNR Criteria (07:00-19:00, Monday – Saturday) | 55 | 45 | 65 |
| EPNR criteria met? | ✓ | ✓ | ✓ |
| **Location 2 – 2974 Great Southern Highway, St Ronans** | | | |
| | Noise Levels (dBA) | | |
| | $L_{A1}$ | $L_{A10}$ | $L_{Amax}$ |
| Computed Levels | 43 | 38 | 47 |
| Background Levels | 65 | 46 | 70 |
| EPNR Criteria (07:00-19:00, Monday – Saturday) | 55 | 45 | 65 |
| EPNR criteria met? | ✓ | ✓ | ✓ |

Based on the results of the SoundPLAN acoustic software modelling performed by VIPAC, it can be summarised that the noise levels generated at the noise sensitive receivers due to the construction and operation of the Allawuna Landfill facility are within the EPNR criteria. This demonstrates that the aural amenity of the surrounding area will remain unaffected by the Allawuna Landfill without the need for the construction of acoustic barriers/bunds.

## 4.3 NOISE CONTROL MEASURES

Despite VIPAC's environmental noise assessment concluding that the operation of the Allawuna Landfill facility will be in line with the EPNR criteria, SITA will implement the following management and mitigation measures to further minimise the likelihood of noise generated on-site effecting the aural amenity of nearby sensitive receptors (including staff):

- Personnel will have access at all times to operational manuals for equipment being utilised and must be familiar with the procedures detailed in the operations manual,
- Requirement for staff wear appropriate hearing protection if in close proximity to machinery for extended periods,
- Speed restrictions will be enforced on the internal access roads (60 km/h between Great Southern Highway and the right-angled turn in the access road, shown in **Drawing ALLA-09** of the Works Approval, and 40 km/h everywhere else),
- Appropriate signage is maintained displaying a contact number to call SITA in the event of a complaint from a member of the public. SITA will record any complaints received; including the date, nature and resolution action of any complaints,
- Following complaints, the source of any excessive noise is identified and work practices modified or rescheduled to reduce or eliminate the risk of future events,
- All of the heavy machinery and mechanical plant used on-site will be fitted with acoustic panels and mufflers (exhaust silencers),
- All mobile plant used on site is regularly serviced including exhaust mufflers, and
- Speed limits are enforced on all site access roads.

## 4.4 NOISE MONITORING

In order to confirm the results of the Environmental Noise Assessment carried out by VIPAC, noise monitoring will be undertaken once each during the construction and operational phases of the facility. The monitoring event during the operational phase will take place during the first three months of the facility's operational life. The objective of these monitoring events will be to confirm that the site is fully compliant with the ENPR and the monitoring events will be carried out in accordance with *AS/NZS 1269.1:2005 Occupational noise management Part 1: Measurement and assessment of noise immission and exposure.*

# 5 REFERENCES

Environmental Protection Authority, 2010. Environmental Protection (Noise) Regulations 1997 (As Amended).

Environmental Protection Authority, 2005. Guidance Statement No 3, Separation Distance between Industrial and Sensitive Land Uses.

Standards Australia, 2005. Occupational noise management Part 1: Measurement and assessment of noise immision and exposure, AS/NZS 1269.1:2005, Standards Australia, NSW.

VIPAC Engineers & Scientists, 2015. Allawuna Environmental Noise Assessment.

# ATTACHMENT J
## Landfill Stability

# TECHNICAL MEMORANDUM

**DATE** 14 July 2015

**REFERENCE No.** 147645033-025-M-RevA DRAFT

**TO** John Jones
SITA Australia Pty Ltd

**CC** Roger Parker

**FROM** Liza du Preez

**EMAIL** ldupreez@golder.com.au

**ADDENDUM TO THE ALLAWUNA FARM LANDFILL WORKS APPROVAL APPLICATION (mky1ff) LANDFILL STABILITY**

## 1.0 INTRODUCTION

Sita Australia Pty Ltd (SITA) has appointed Golder Associates Pty Ltd (Golder) to provide engineering design services and supporting technical advice for the submission of a Works Approval Application (WAA) for the Allawuna Farm Landfill. The WAA (No. mky1ff) was submitted by Golder to the Department of Environment Regulation (DER) on 17 April 2015.

Following submission of the WAA, the DER has requested SITA to provide additional information, in a letter dated 17 June 2015 (Reference [1]), in order to continue processing the application. This included review of some aspects related to the landfill stability assessments prepared by Golder (refer to Section 2.0 below).

This document provides the addendum items and/or additional information, as requested by the DER.

## 2.0 REQUESTED LANDFILL STABILITY INFORMATION

The DER requested the following information regarding the landfill stability in the letter dated 17 June 2015 (Reference [1]):

1) *"Reassessment of the stratigraphic models for global stability analysis to consider and clearly identify the variable soil and potentially significant rock depths across the proposed landfill footprint area;*

2) *Re-analysis of critical stability analyses (Figure C1, C2) with reduced effective cohesion to consider the presence of granular soils as encountered within selected test pits;*

3) *Sensitivity analysis of the strength parameters assigned to waste under maximum credible earthquake conditions."*

## 3.0 STABILITY ANALYSES REASSESSMENT

### 3.1 Global Stability Analyses

#### 3.1.1 Material Parameters

As described in the submitted WAA (refer to the Cell 1 and 2 Construction in mky1ff), the *in situ* sandy material found within the landfill footprint will be excavated to a maximum depth of -1.5 m below finished subgrade level; hence *in situ* Sand will only be encountered at depths below 1.5 m within the landfill footprint. Engineered clayey material will be placed and compacted over the entire landfill basin and side slopes to form a layer of minimum 500 mm thickness.

The material parameters adopted for the reassessment of the global stability analyses are summarised in Table 1. Properties for all materials, except *in situ* Sand, are the same as adopted in the previous stability analysis (Reference [2] and the WAA).

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**Table 1: Summary of Material Parameters for Geotechnical Stability Analyses**

| Parameter | | Material | | | | | |
|---|---|---|---|---|---|---|---|
| | | Waste[1] | Liner System[2] | Embankment and Subgrade[3] | *In Situ* Clay[4] | Bedrock[5] | *In Situ* Sand[6] |
| Unit Weight ($kN/m^3$) | Unsaturated | 10 | 10 | 18.5 | 18.5 | - | 20 |
| | Saturated | 12 | | 22 | 22 | | 20 |
| Drained | Cohesion/ Adhesion (kPa) | 5 | 0 | 5 | 5 | - | 0 |
| | Friction Angle (degrees) | 25 | 16 | 28 | 28 | - | 30 |

Notes: [1]Waste parameters based on published values for municipal solid waste (Reference [3]).
[2]Liner system parameters adopted based on previous experience with similar materials.
[3]Parameters for compacted Sandy Clay/Clayey Sand based on laboratory testing results.
[4]Parameters for uncompacted (i.e. *in situ*) Sandy Clay/Clayey Sand based laboratory testing results
[5]Material assumed as bedrock considered to have infinite strength.
[6]Parameters for uncompacted Sand based on geotechnical field investigation assessments.

### 3.1.2 Basal Liner System Interface Stability Reassessment

In response to item 1 of Section 2.0 above, the global stability of the proposed Allawuna Landfill was reassessed considering the variable soil and rock depths across the proposal landfill footprint area.

As per the submitted WAA, for both cross-sections analysed, the critical failure mode for the stability of the waste landforms is non-circular (i.e. sliding) along the proposed basal liner system. This is the case for both short-term and long-term, static conditions and under earthquake loading. In view of that, only the reassessment of the basal liner system interface stability has been included in this document.

The liner interface stability reassessment is summarised in Table 2. This assessment was carried out using a polyline type of search (non-circular surface type) located within the composite liner layers (i.e. liner material interface), as per previous analyses. Calculated FoS values are shown for the critical section with the lowest FoS (i.e. Section C). Refer to Attachment A for the output figures showing the changed profile sections and the results.

**Table 2: Summary of Results for the Basal Liner System Interface Stability Reassessment**

| Scenario | | Condition[1] | Minimum FoS[2] Required | Calculated FoS[3] | | Output Figures |
|---|---|---|---|---|---|---|
| | | | | Revised | Previous | |
| 1 | Operational, Static, Low pore pressure build-up on liner | Short-Term | 1.3 | 1.76 | 1.76 | A1 |
| | | Long-Term | 1.5 | 1.94 | 1.94 | A2 |
| 2 | Operational, Static, High pore pressure build-up on liner | Short-Term | 1.1 | 1.79 | 1.72 | A3 |
| | | Long-Term | 1.1 | 1.99 | 1.87 | A4 |
| 3 | Operational, Earthquake (OBE), No pore pressure build-up on liner | Short-Term | 1.1 | 1.32 | 1.32 | A5 |
| 4 | Operational, Earthquake (MDE), No pore pressure build-up on liner | Short-Term | 1.0 | 1.14 | 1.14 | A6 |
| 5 | Post Closure, Static, Low pore pressure build-up on liner | Long-Term | 1.5 | 1.93 | 1.93 | A7 |
| 6 | Post Closure, Earthquake (MCE), No pore pressure build-up on liner | Long-Term | 1.0 | **0.81** | **0.81** | A8 |

Notes: [1]Maximum slope for short-term condition is 1V:3H for the embankments (i.e. division bunds) and 1V:3H for the waste. Maximum slope for long-term condition is 1V:3H for the embankments (i.e. perimeter bunds) and 1V:5H for the waste.
[2]Minimum FoS based on typical values used internationally for municipal solid waste landfills and experience with similar projects in Australia.
[3]FoS values rounded up to two decimal places. Values in **bold** do not meet minimum acceptable FoS (refer to the deformation analysis in mky1ff).

Based on the results presented in Table 2, results for all scenarios were consistent with or higher than the values reported in the WAA. The minimum acceptable factor of safety (minimum FoS) is achieved for scenarios 1 to 5. As per the submitted WAA, although the result for Scenario 6 is lower than the minimum FoS, the estimated permanent deformation due to earthquake action (maximum credible earthquake, MCE) is well below acceptable values (refer to the deformation analysis in Reference [2] and the WAA).

## 3.2 Foundation and Embankment Stability Analyses

In response to item 2 of Section 2.0, the global stability of the foundation and embankment materials for the proposed Allawuna Landfill was reanalysed using reduced effective cohesion to consider the presence of granular material in the *in situ* soil.

The foundation and embankment stability reevaluation is summarised in Table 3. This assessment was carried out using a grid and slope type of search (circular surface failure mechanism) located through the waste landform, embankment and foundation, as per previous analyses. Calculated FoS values are shown for the critical section with the lowest FoS (i.e. Section C) for drained parameters. Refer to Attachment A for the output figures showing these results.

**Table 3: Summary of Results for the Foundation and Embankment Stability Reevaluation**

| Scenario | | Condition[1] | Minimum FoS[2] Required | Calculated FoS[3] | | Output Figures |
|---|---|---|---|---|---|---|
| | | | | Revised | Previous | |
| 5 | Post Closure, Static | Long-Term | 1.5 | 1.72 | 2.14 | C1 |
| 6 | Post Closure, Earthquake (MCE) | Long-Term | 1.0 | 1.03 | 1.08 | C2 |

Notes: [1] Maximum slope for short-term condition is 1V:3H for the embankments (i.e. division bunds) and 1V:3H for the waste. Maximum slope for long-term condition is 1V:3H for the embankments (i.e. perimeter bunds) and 1V:5H for the waste.
[2] Minimum FoS based on typical values used internationally for municipal solid waste landfills and experience with similar projects in Australia.
[3] FoS values rounded up to two decimal places.

Based on the results summarised in Table 3, although the calculated FoS using the reduced effective cohesion of *in situ* sandy material were lower than the ones reported in the WAA, the minimum acceptable factors of safety (minimum FoS) are achieved for all scenarios and modelled conditions in regards to foundation and embankment stability, prior to and post waste deposition.

## 3.3 Waste Sensitivity Analysis

In response to item 3 of Section 2.0, sensitivity analyses were carried out for the waste strength parameters under maximum credible earthquake (MCE) conditions.

As per the submitted WAA, the MCE horizontal seismic coefficient is equivalent to 0.250 g (based on a PGA of 0.200 g and a site amplification factor of 1.25). The associated global minimum FoS of 0.95 was reported in the previous assessment. The adopted waste strength parameters were based on published values for municipal solid waste (refer to Table 1). The waste strength used corresponded to the suggested design line c'= 5 kPa and $\varphi'$= 25° (effective cohesion and friction angle, respectively) reported by Jones et. al. (1997) (Reference [3]). This design line is shown in the context of the strength envelope from published data presented in Figure 1.

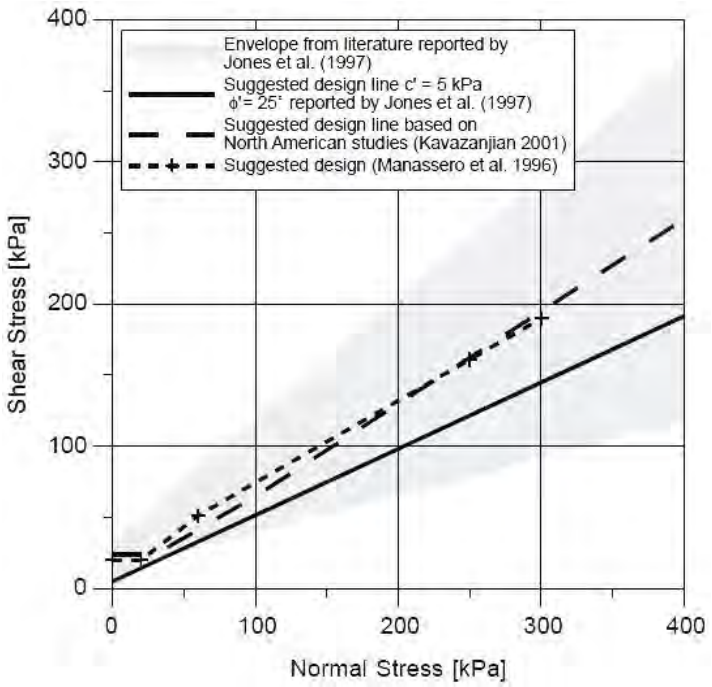


*Figure 1: Strength envelope for waste (Reference [3])*

For the purposes of the current sensitivity analysis the effect of modifying the c' and $\varphi'$ values within the lower range of the envelope on the global minimum FoS under the design earthquake conditions were investigated. The results of the sensitivity analysis are presented in Table 4.

**Table 4: Results of waste strength sensitivity analysis**

| Parameter | Previous Study | Sensitivity Case 1 | Sensitivity Case 2 | Sensitivity Case 3 |
|---|---|---|---|---|
| Effective cohesion c' (kPa) | 5 | 5 | 10 | 10 |
| Effective friction angle $\varphi'$ (degrees) | 25 | 15 | 15 | 25 |
| Global minimum FoS | 0.95 | 0.71 | 0.79 | 1.02 |

Based on the results summarised in Table 4, a cohesion of 10 kPa for the previously assumed $\varphi'$=25° would result in a FoS above unity. The median values of c' and $\varphi'$ in the dataset represented in Figure 1 are 10 kPa and 26.5°, respectively. The values adopted in the submitted WAA study are therefore regarded as conservative estimates.

For the 'worst case' scenario represented by Sensitivity Case 1 in Table 4, the yield acceleration (defined as the model PGA for which the FoS equals unity) was calculated to be 0.11 g. The corresponding displacement in the event of earthquake-induced slope failure has been calculated using the simplified methods proposed by Newmark (1965) and is approximately 174 mm, which remains within the allowable range (<1000 mm) suggested for MSW facilities (References [4] and [5]).

## 4.0 CONCLUSION

In view of the results of the reassessment of the global stability analyses for the Allawuna Landfill, the following conclusions can be made:

- The strength of materials encountered at depths 1.5 m below finished subgrade level (i.e. *in situ* clayey material, *in situ* Sand, bedrock) does not significantly affect the overall stability of the landfill. In most cases, especially during operational stages, the presence of sandy material at or below the -1.5 m depth is beneficial to the overall stability of the landfill.

The sensitivity analysis for the waste strength under seismic conditions has also demonstrated the following:

- The strength parameters used in the previous study are conservative estimates in the context of published data on the shear strength of MSW.
- In the event that the shear strength of the waste exhibited values reflecting the lower-bounds of the published strength envelope, the resulting displacements associated with a maximum credible earthquake are acceptable.

**GOLDER ASSOCIATES PTY LTD**

Liza du Preez
Associate, Principal Landfill Engineer

Roger Parker
Principal

LLC,MK/LDP,RP/hsl

Attachments: A – Stability Analyses Figures
B – Waste Parameter Graph

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[1] Department of Environment Regulation, Western Australia, “Environmental Protection Act 1986 – Works Approval Application: Request for Further Information,” *DER Ref. DER2015/000628,* 17 June 2015.

[2] Golder Associates, “Allawuna Farm Landfill: Stability Analysis and Liner System Integrity Assessment for Landfill Development,” *Report No. 147645033-012-R-Rev0,* March 2015.

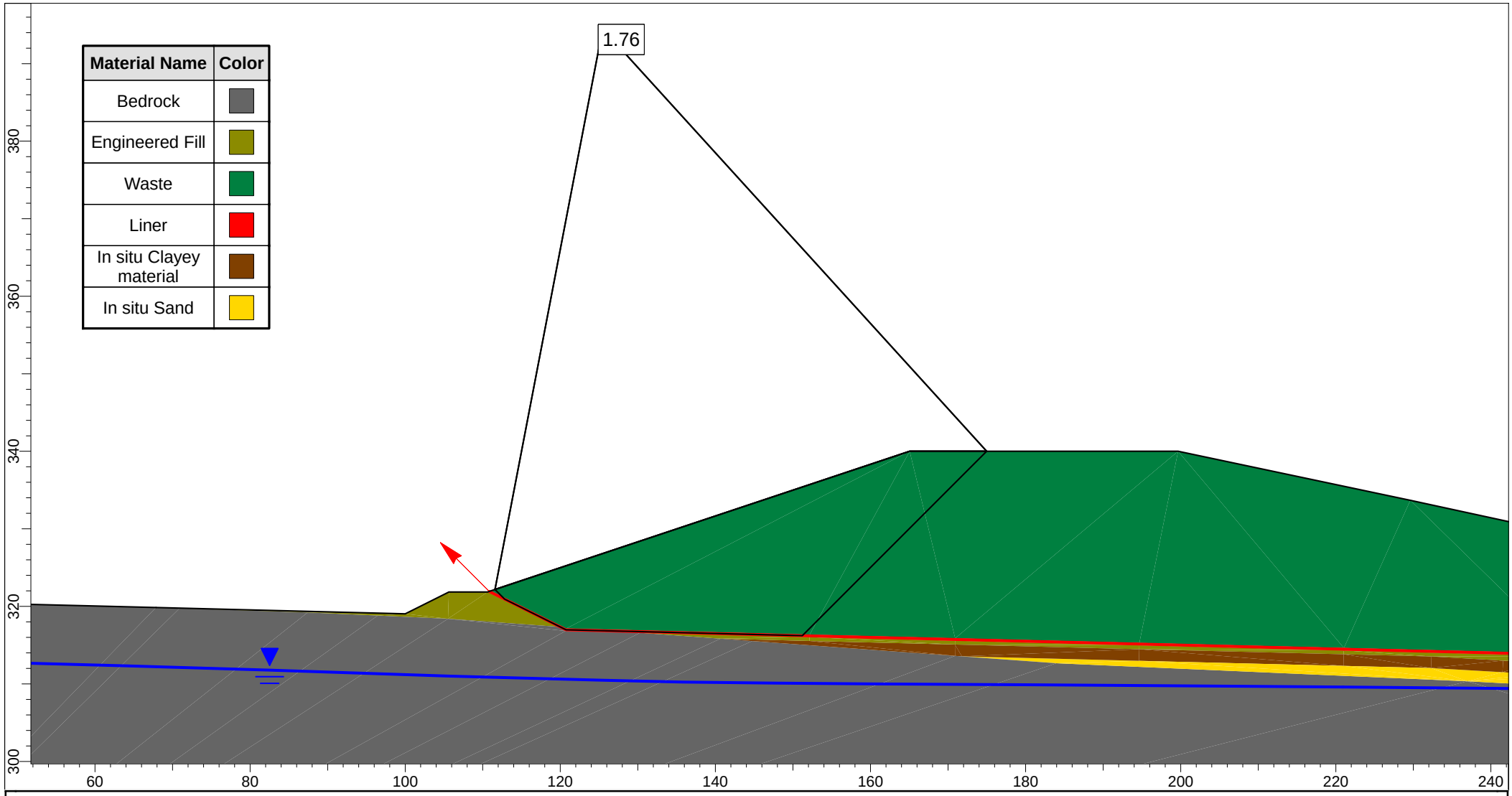
[3] N. Dixon, D. Russell and V. Jones, “Engineering properties of municipal solid waste,” *Geotextiles and Geomembranes,* vol. 23, pp. 205-233, 2005.

[4] G. N. Richardson, E. Kavazanjian Jr. and N. Matasovi, “Seismic Deisgn Guidance for Municipal Solid Waste Landfill Facilities,” *United States Environmental Protection Agency (EPA), RCRA Subtitle D (258),* April 1995.

[5] E. Kavazanjian Jr., “Seismic Design of Solid Waste Containment Facilities,” *Proceedings of the Eight Canadatian Conference on Earthquake Engineering,* pp. 51-89, June 1999.

## ATTACHMENT A

**Stability Analyses Figures**

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ALLAWUNA FARM LANDFILL

STABILITY ANALYSIS

LINER INTERFACE MINIMUM FACTOR OF SAFETY
OPERATIONAL, STATIC, LOW PORE PRESSURE
SECTION C

SCALE 1:700 REVISION 1 **FIGURE A1**

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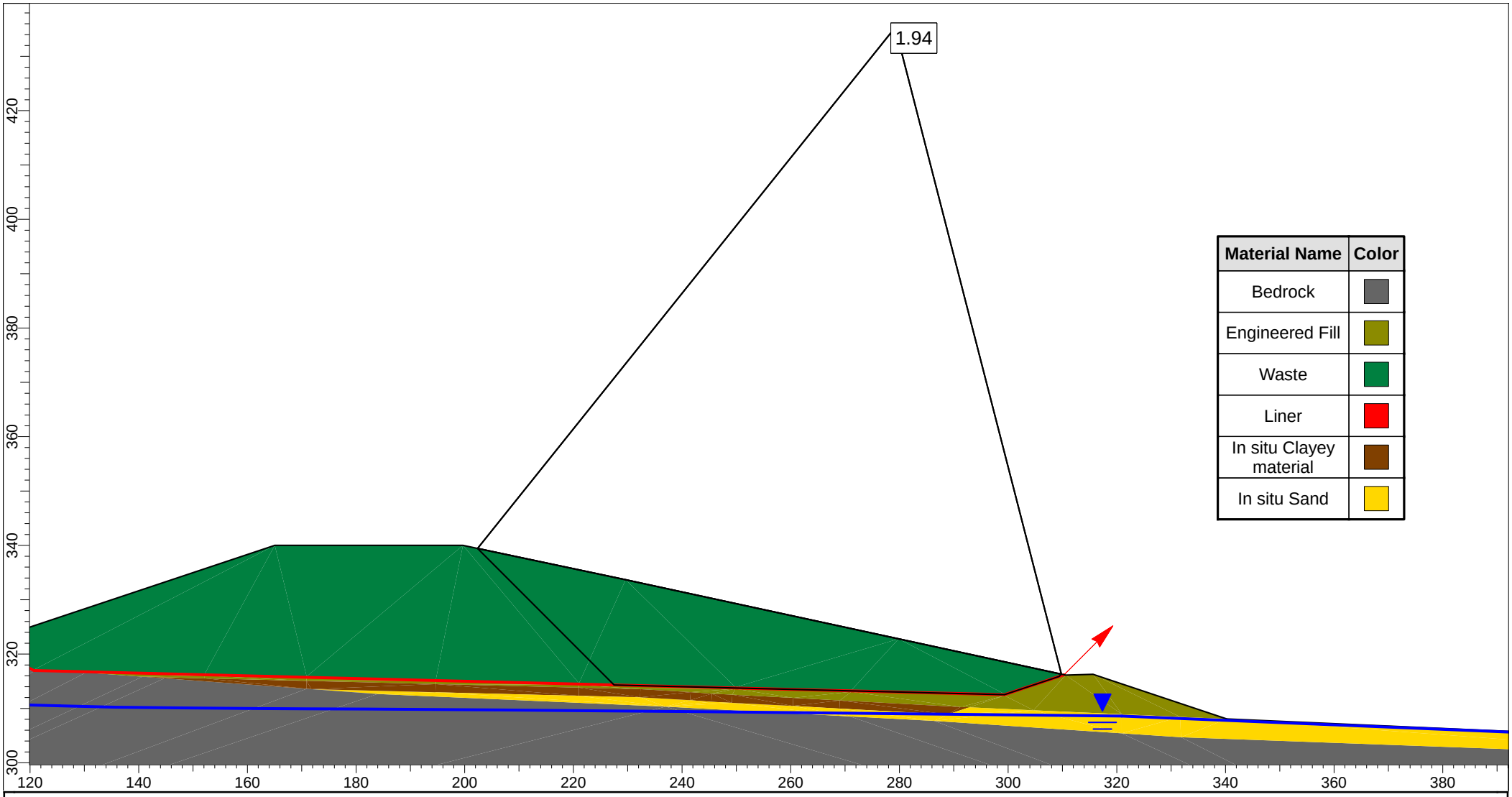


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SCALE 1:1000 REVISION 1 **FIGURE A2**

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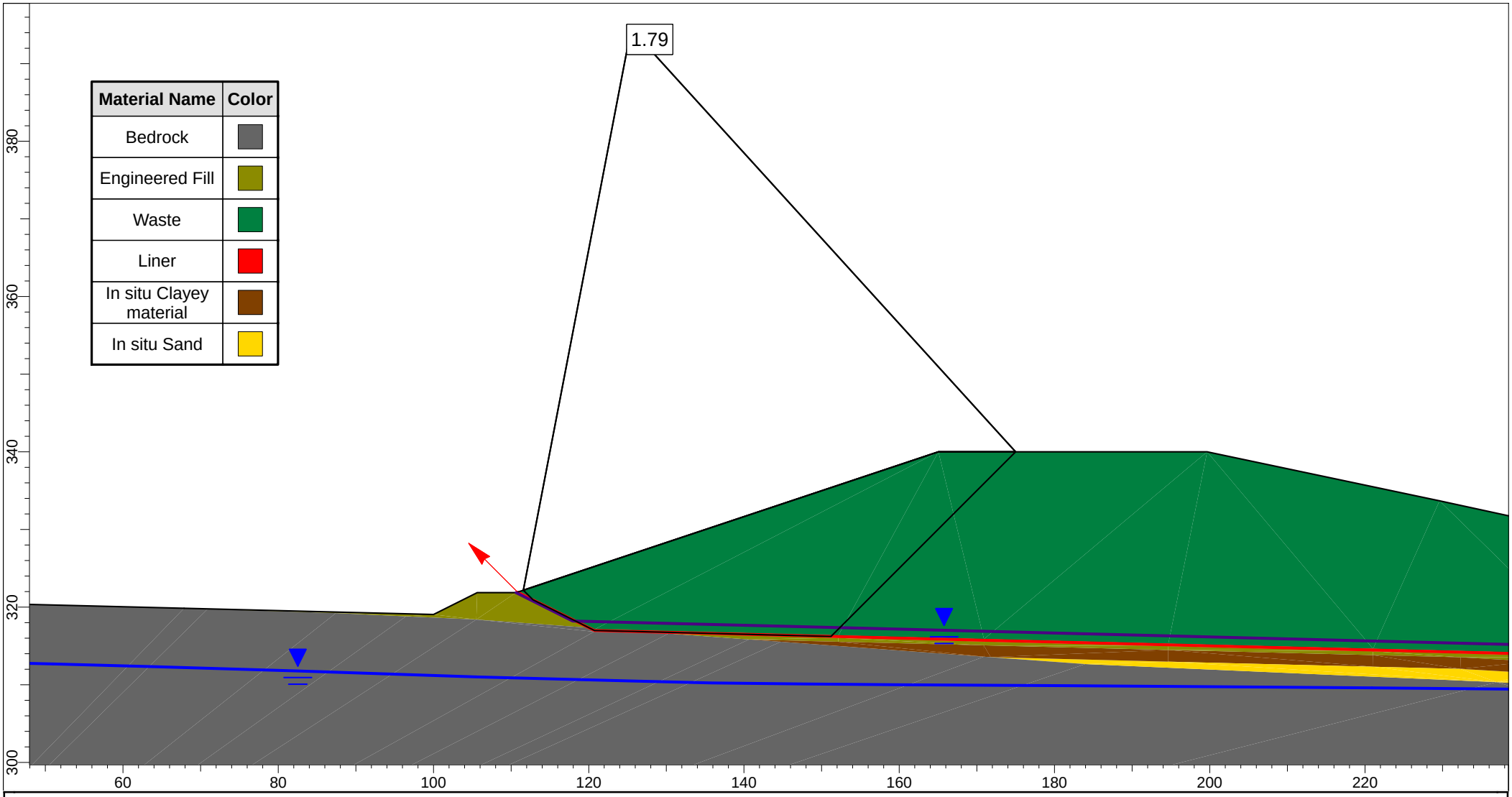


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SCALE 1:700 REVISION 1 **FIGURE A3**

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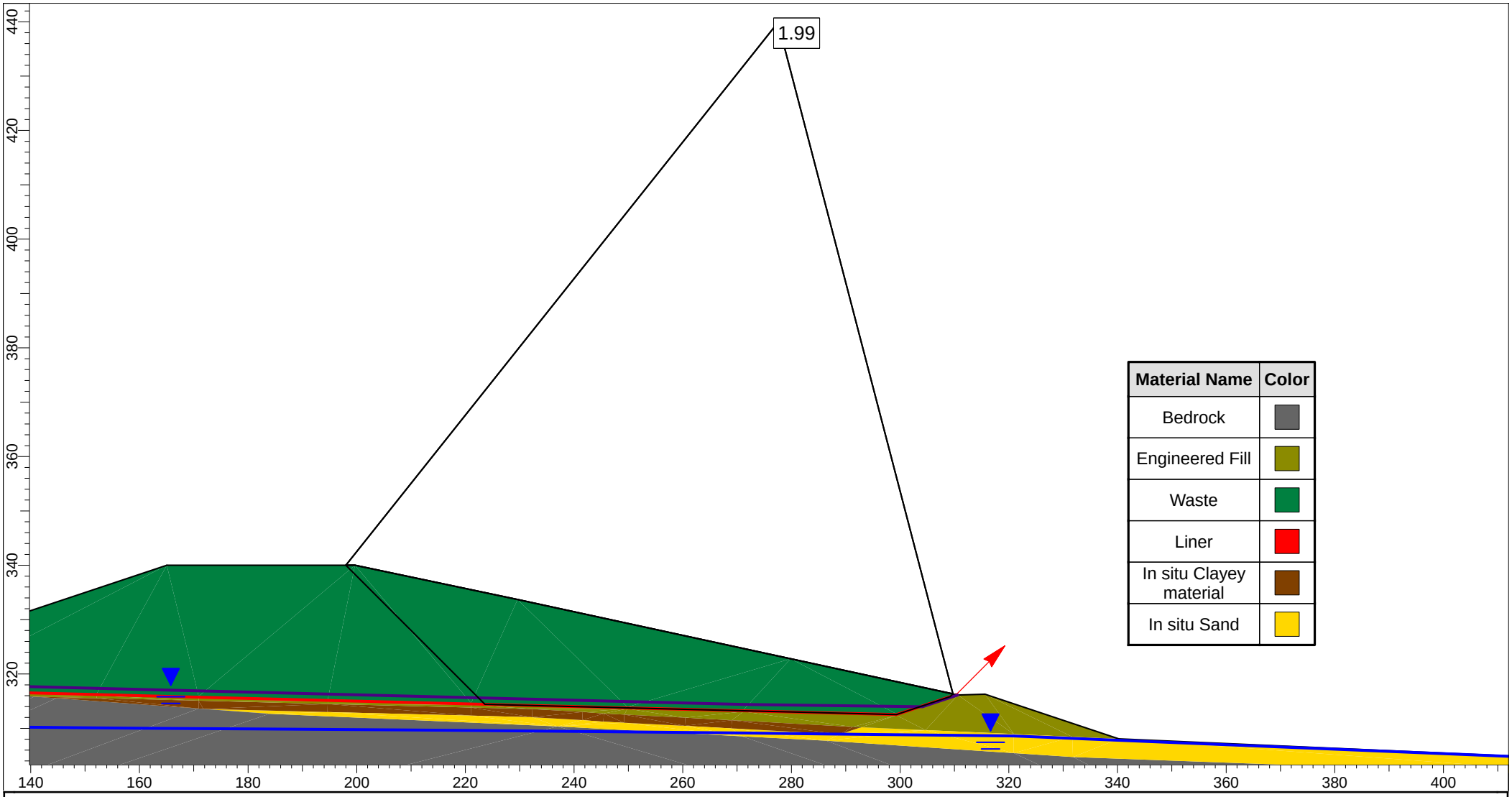


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SCALE 1:1000 REVISION 1 **FIGURE A4**

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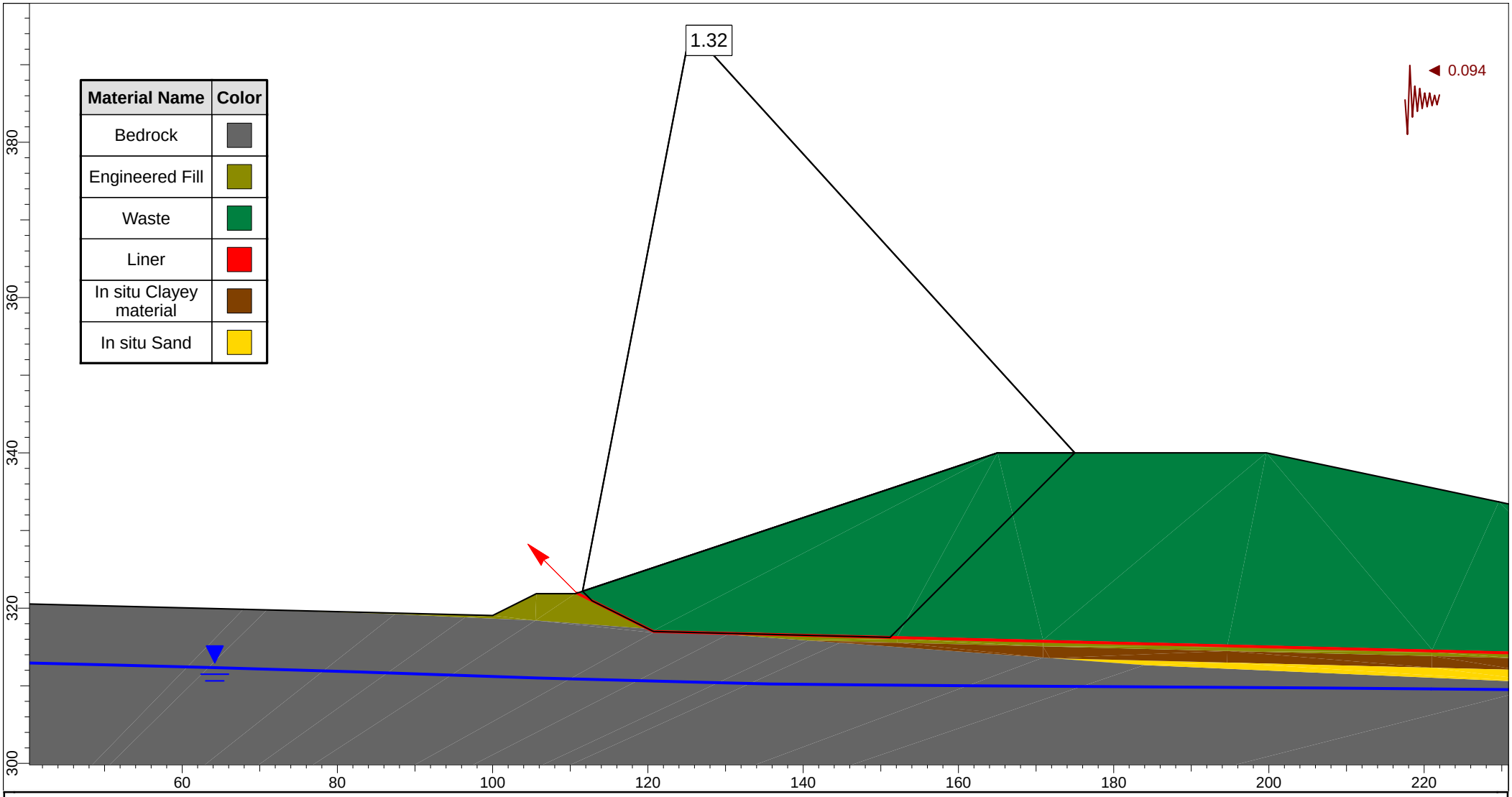


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SCALE 1:700 REVISION 1 **FIGURE A5**

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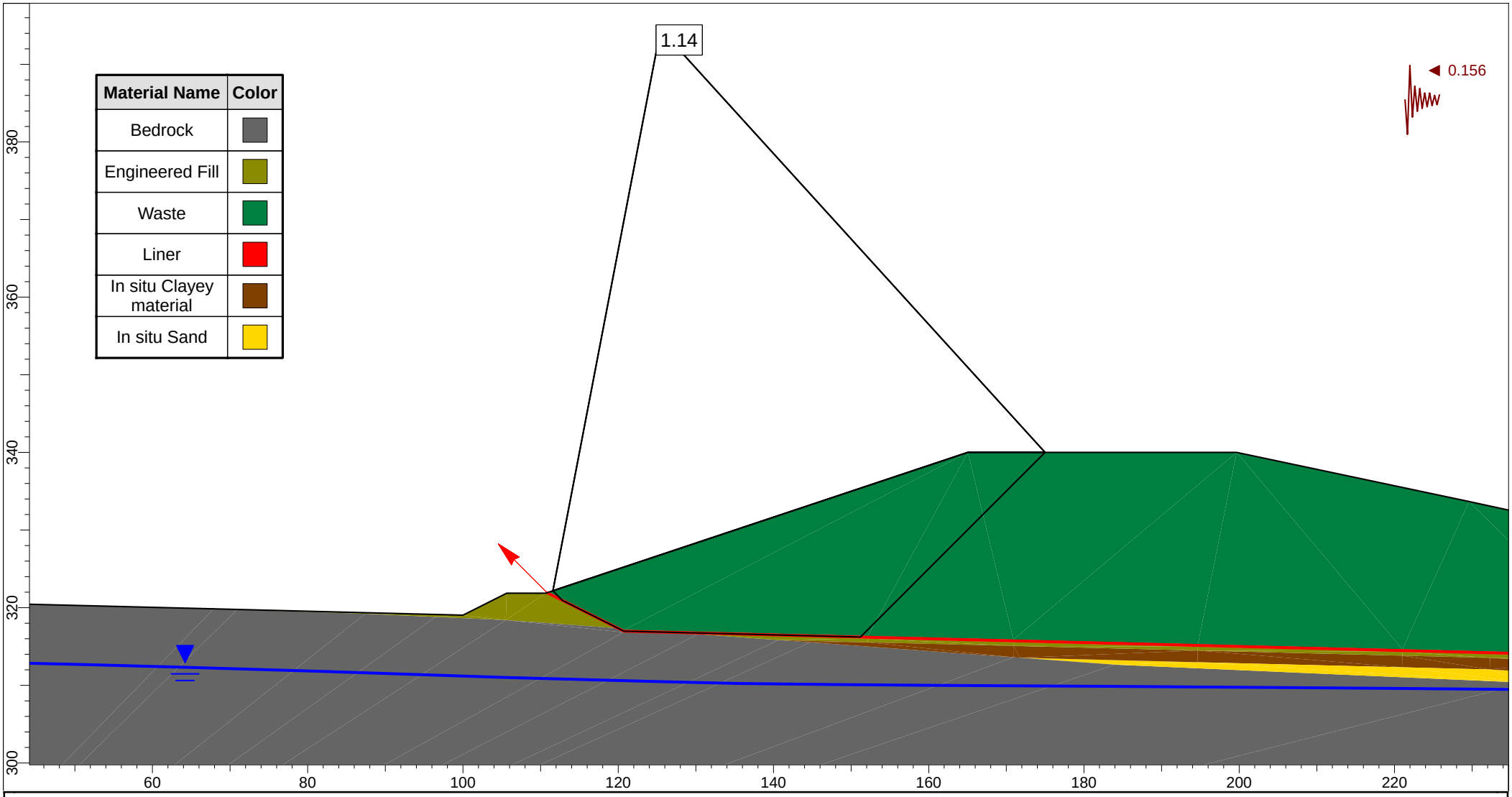


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SCALE 1:700 REVISION 1 **FIGURE A6**

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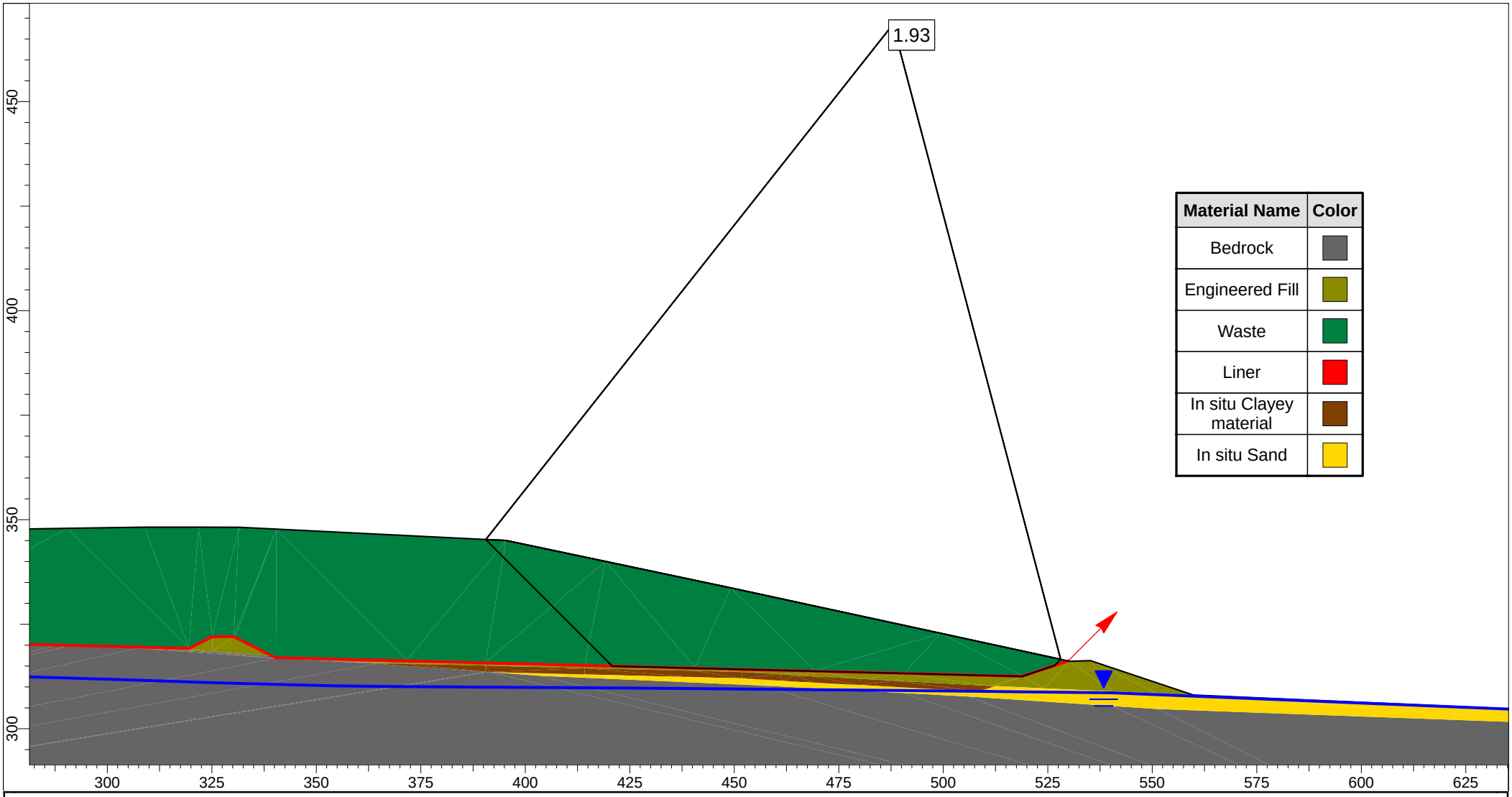


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SCALE 1:1300 REVISION 1 **FIGURE A7**

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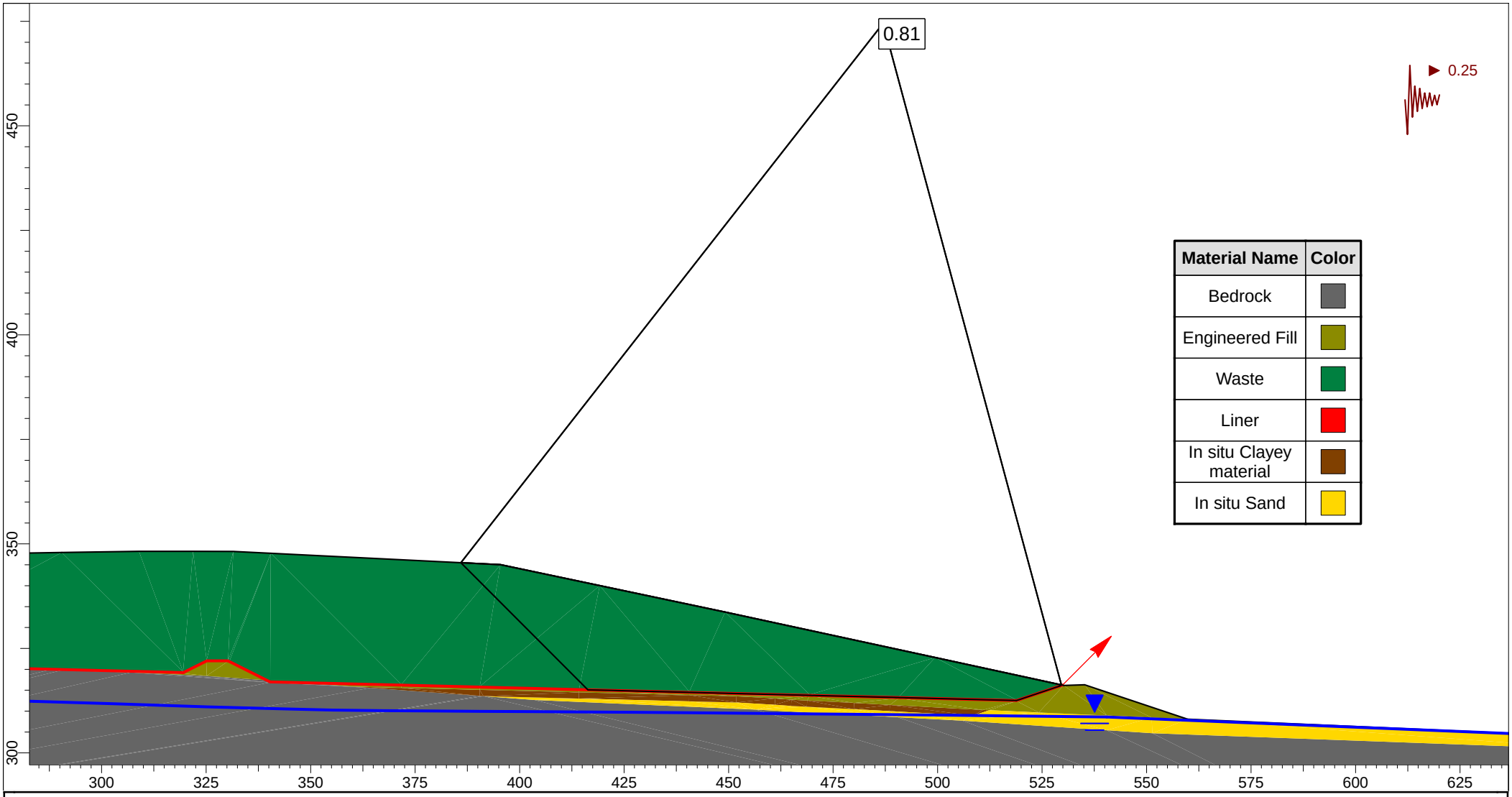


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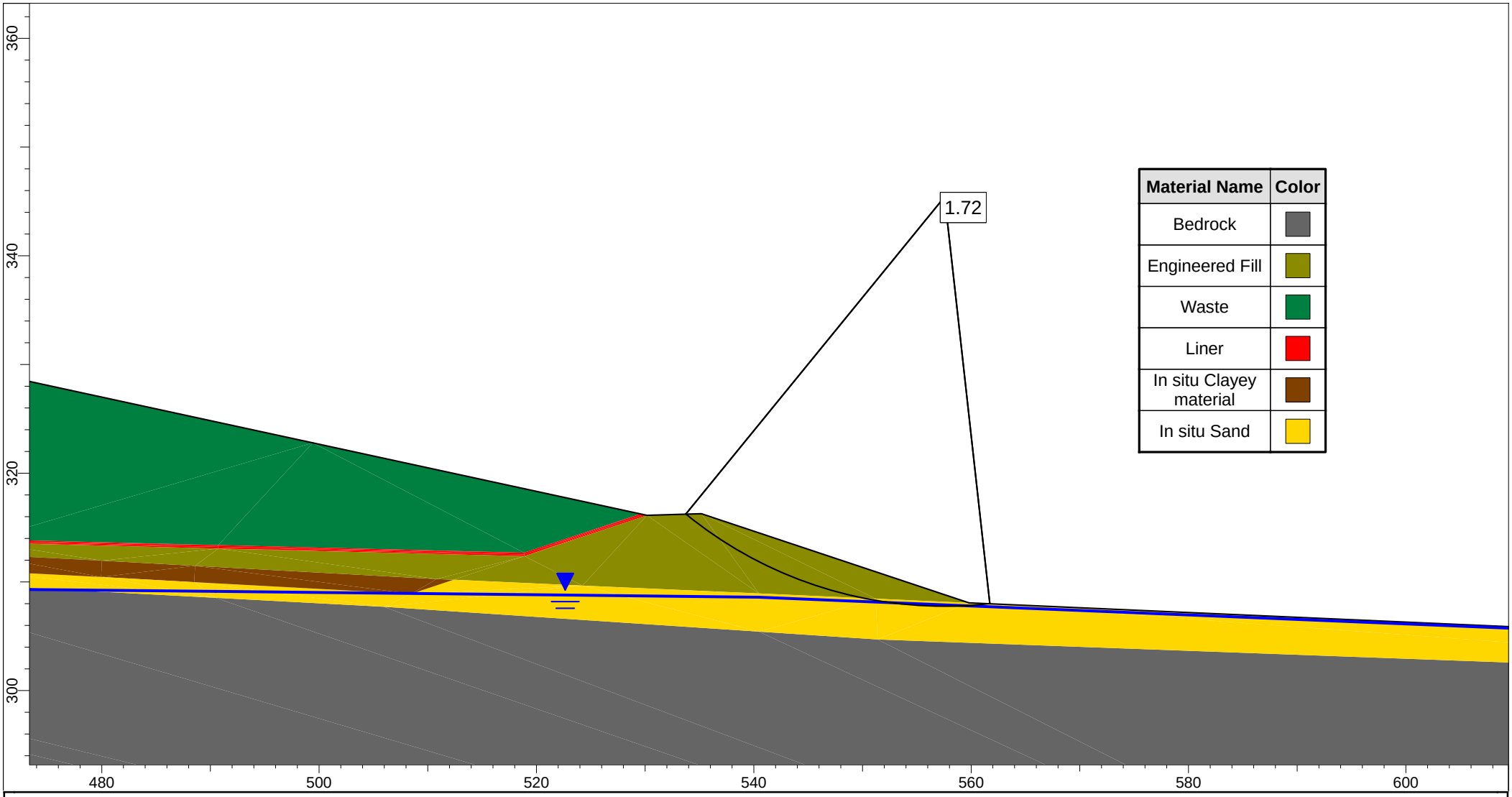


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SCALE 1:500 REVISION 1 **FIGURE C1**

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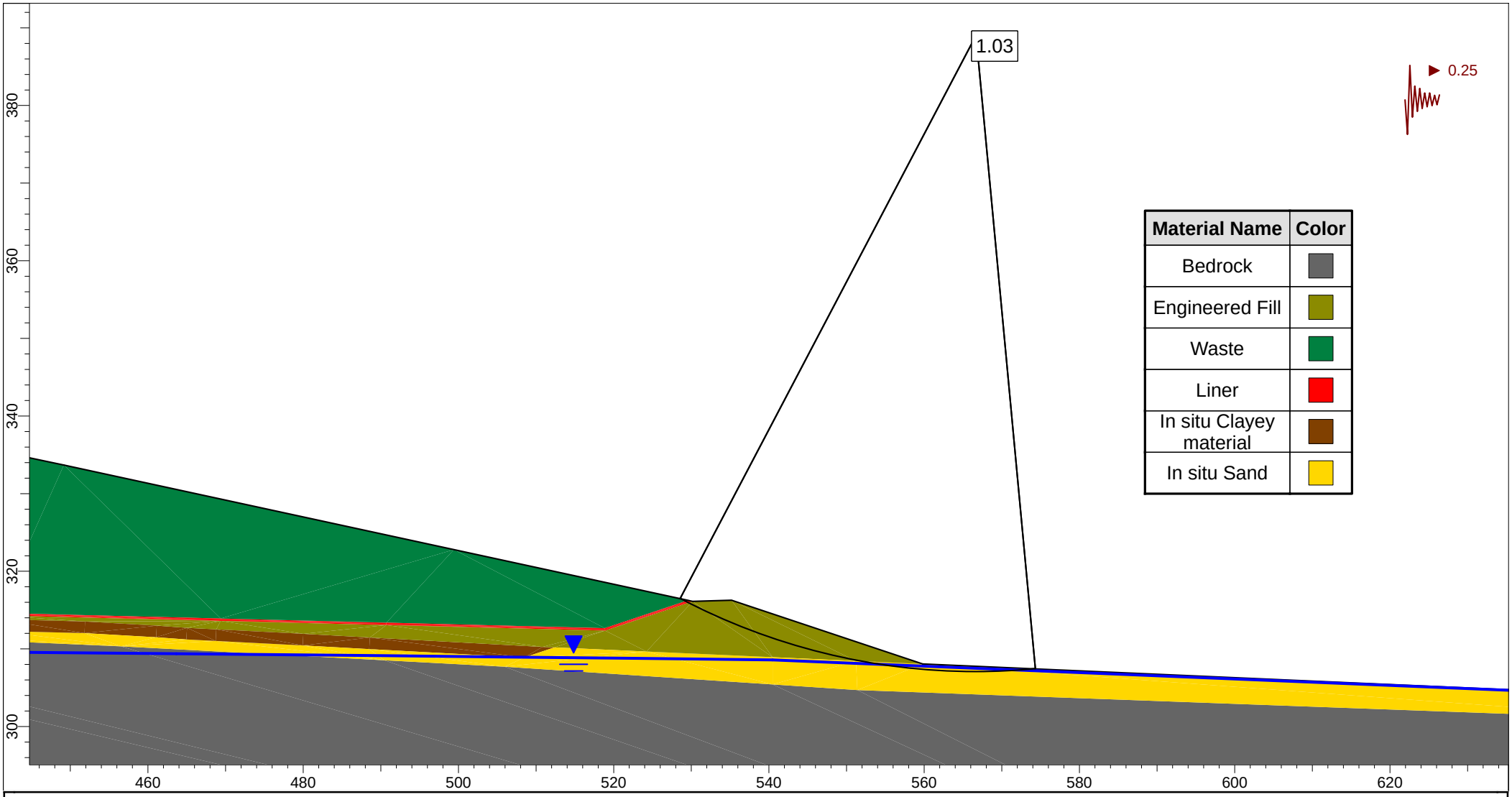


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SCALE 1:700 REVISION 1 **FIGURE C2**

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## ATTACHMENT B

**Waste Parameter Graph**

Figure B1 shows the waste strength parameters used in the previous stability assessment[1] in relation to the cases analysed as part of the sensitivity analyses. The envelope is bounded by the data presented in Dixon, (2004)[2]. Refer to body of memorandum for full references.

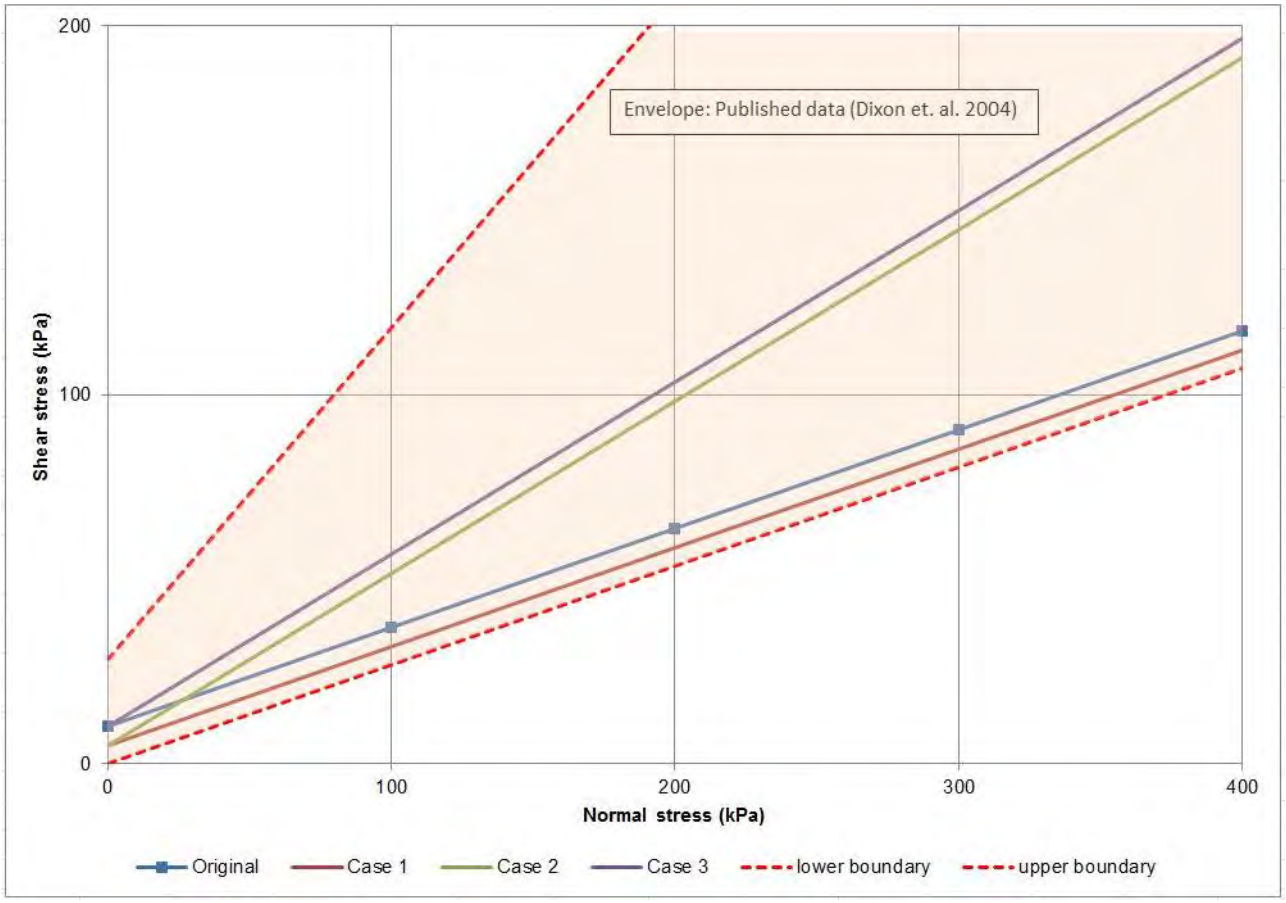


*Figure B1: Waste strength parameters in relation to published data*

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[1] Golder Associates, "Allawuna Farm Landfill: Stability Analysis and Liner System Integrity Assessment for Landfill Development," *Report No. 147645033-012-R-Rev0,* March 2015.

[2] N. Dixon, D. Russell and V. Jones, "Engineering properties of municipal solid waste," *Geotextiles and Geomembranes,* vol. 23, pp. 205-233, 2005.