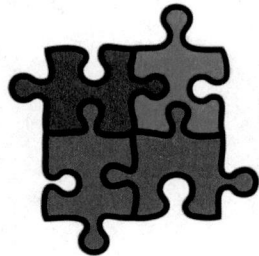




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Extractive Industries Licence Application Dust Management Plan

LOT 5, ON PLAN 7892 WALYUNGA ROAD

CITY OF SWAN

July 2016

PREPARED FOR:

BRIKMAKERS

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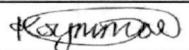
DOCUMENT CONTROL SHEET

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Client: BRIKMAKERS
Project: Lot 5 Walyunga Road
Title: EIL Application: Dust Management Plan
Reference: **004_4_EIL_EXTENSION_DUST**
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Appendices

Appendix 1	Excavation Licence
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Abbreviations

EMP	Environmental Management Plan
DMP	Dust Management Plan
EPA	Environment Protection Authority
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
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SVOC	Semi-volatile organic compound
TDS	Total dissolved solids
TPH	Total Petroleum Hydrocarbons
VOC	Volatile organic carbon



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EXECUTIVE SUMMARY

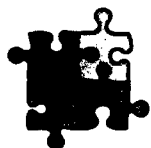
This management plan has been prepared in support of an application to approve the continuation and extension of extraction of clay at Lot 5 (91) Walyunga Road, Bullsbrook, approximately 30 kilometres to the north east of Perth Central Business District. The proponent, Brikmakers (previously BGC Clay Products Pty Ltd) are leasing the site and seek the relevant permissions and approvals to continue to extract the abundant clay and schist resource from the site with the addition of fill sand extraction.

This application examines the environmental and planning aspects of the proposed development to extend the current extraction area from 8ha to 20ha, along with a 10ha area to the east of the current extraction area to extend a new stockpile area and allow for further clay extractions. The current clay and schist extraction rates shall remain the same as per current rates through the life of the project.

The site is located in a rural location beyond the suburban fringe of the Perth Metropolitan Area. The current land owners are operating a construction and demolition recycling facility with the addition of a sand pit. There are 6 residential properties within 1km of the existing licensed facility.

The proposal to extract from the site is accompanied with various environmental management measures which will ensure that the proposed development has minimal impact on the surrounding natural and human environment.

Dust has the potential to cause environmental and health impacts, the prevention of dust uplift is generally regarded as the most effect means of eradicating errant dust. A range of additional procedures have been detailed in this management plan. SERS have evaluated the risk of dust onsite and is currently of medium risk however, implementation of the management strategies discussed in this document the risk can be reduced to Low.



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1 INTRODUCTION

This management plan has been prepared by Site Environmental and Remediation Services (SERS) on behalf of Brikmakers in support of the application to approve further clay exaction at Lot 5 (91) Walyunga Road, Bullsbrook (the Site).

The Site has been subject to extraction of basic raw materials since 1965 with periods of inactivity. Brikmakers are a major brick manufacturer in the Perth Metropolitan area. The use of resource from this site will provide a portion of the required resources to facilitate ongoing brick manufacturing. The site will be managed in accordance with Brikmakers management procedures used on similar sites and also to industry best practises.

The standard Brikmakers process comprises the periodic excavation of material which is then appropriately stockpiled on site. The material is then transported to the Brikmakers factory in South Guildford.

Brikmakers are applying for Planning Approval and the Extractive Licence to extend the clay extraction area from 8ha to 20 ha along with a 10ha area to the east of the current extraction area to extend a new stockpile area and further clay extractions for a period of 10 years.

The proposed extraction area is included in the Western Australian Planning Commission (WAPC) Statement of Planning Policy No. 10. Basic Raw Materials, as a Priority Resource Location.

In 2007, Brikmakers were granted an excavation licence and planning approval for the extraction of large quantities of clay from Lot 5 (91) Walyunga Road, Bullsbrook (hence forth the "Site"), (Excavation Licence Reference DA-93/2007/A and WAPC approval 21-5986-4).

This document outlines the proposed works and highlights management strategies taken to minimise disturbance from dust.



2 DUST CONTROL MEASURES

Dust has the potential to be generated from three sources. The first being excavation and loading; the second, cartage on gravel roads and the third being crushing.

With dust having the potential to cause environmental and health impacts, the prevention of dust uplift is generally regarded as the most effect means of eradicating errant dust, however a range of procedures are detailed in section.

Management and mitigation procedures are proposed to minimise the generation of dust during site activities through the use of an active dust management plan.

2.1 Risk Matrix

In using the following Emissions Risk Reduction Matrix (Table 1) to outline the risk of dust on the Site, SERS have evaluated the risk of dust onsite is of a medium risk:

Table 1- Emissions Risk Reduction Matrix

		Relative proximity of the interested party with regards to the emission				
		Immediately Adjacent	Adjacent	Nearby	Distant	Isolated
Level of Community Interest or Concern	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Relative proximity of the interested party with regards to the emission	Nearby
Level of Community Interest or Concern	3



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Using the above evaluations therefore it falls under a *risk that lies on the risk acceptance threshold and requires active monitoring. The implementation of additional measures could be used to reduce the risk further.* The proponent accepts this responsibility to actively monitor visual dust while taking control measures of industry best practice to minimise dust.

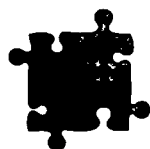
While the current risk of dust on the site has been deemed medium risk, the following management suggestions and targets have been developed to reduce this risk rating.

3 SITE MANAGEMENT FOR DUST

Environmental risk assessments should be prepared for all dust generating processes and activities. Regulations imposed upon the designer of dust management plan have a duty to ensure that, so far as is reasonably practicable, any design will conform with the following hierarchy of risk control:

- Eliminate – actions to prevent the dust at its source
- Separation/isolation - isolate or separate people from the hazard by use of barriers or distance
- Administrative controls - use training, rules, procedures to reduce the risk of the hazard

With dust having the potential to cause environmental and health impacts, the prevention of dust uplift is generally regarded as the most effect means of eradicating errant dust, however the range of procedures detailed below are proposed.



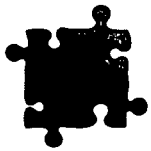
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3.1 Method and materials for dust suppression

Table 1: Control measures for the suppression of potential dust at Lot 5 Walyunga Road, Bullsbrook.

Category	Potential Dust Source	Significance (High, Med, Low)	Control Measures	Risk after management
Traffic	Major haul roads and traffic routes	Medium	Compaction, Grading & Water of gravel roads and sweeping of bitumen roads to prevent dust uplift	Low
	Maintenance of unsurfaced roads and verges	Medium	Compaction, watering and grading at regular intervals to prevent dust uplift	Low
	Speed control	Medium	20km/hour speed limit. Through site signage this will be conveyed to truck drivers and operatives at the Site.	Low
Boundary separation and visual amenity	Location of plant and equipment	Medium	Extraction area is a significant distance from the site boundary	Low
	Reducing/preventing dust dispersing over the site boundary	Medium	Monitoring of wind conditions including direction and speed as well as a water cart. Bunding and vegetation used as protection barriers	Low
	Stockpile	Medium	Stockpiling area located away from the Site boundary. Materials will be stockpiled in grades and types by the use of a wheeled loader and earthmoving equipment.	Low



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	Small and short-term stockpiles – protected from wind erosion	Medium	Stock piles shall be limited to within pit works area to prevent wind and visual effects for short periods prior to moving to stockpile areas.	Low
	Screening and buffers	Low	Activities are located behind natural barriers, landform and vegetation providing minimal visual impact from the road.	Low
	Visual impacts	Medium	The excavations shall be staged and incorporate bunding. These measures will reduce the visual impacts to surrounding areas. It is expected that very little of the operation will be visible off site.	Low
Transport of materials	Transport of fine powdery material	Medium	Truck loads will be securely covered with canvas material to prevent any dust escaping	Low
	Fine dry materials (~3mm in particle size)	Medium	Truck loads will be securely covered with canvas material to prevent any dust escaping	Low
	Excavation and digging	Medium	Water cart shall make regular passes along with Wind direction and speed monitoring and area bunding	Low
	Preventing dust fly off during transport	Medium	Truck loads will be securely covered with canvas material to prevent any dust escaping	Low

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	Vehicle loading	Medium	Material handling methods that minimize the generation of airborne dust will be used. Damp down using water cart. Drop heights must be kept to a minimum.	Low
--	-----------------	--------	---	-----

3.2 Nearby dwellings at risk

There are six residential dwellings located within 1km of the proposed activities. The closest dwelling is located approximately 450m from the Site however this property is owned by the land owner.

3.3 Meteorological

The following results were generated from the Bureau of Meteorology (BoM) Perth Airport monitor for wind frequency. The results were recorded in 2010 and act as a prediction for wind movements during summer and winter.

Summer: (Indicative month: February)

Results recorded that at 9am there is a 40% chance of easterly winds and between 10% and 20% chance of north easterly and southerly winds (Figure 4).

At 3pm there is between 30% and 40% chance the wind will be south westerly. There is an equal chance between approximately 18% to 22% of easterly and westerly winds respectively (Figure 5).

Winter: (Indicative month: July)

Results recorded that at 9am there is a 30% chance of north easterly winds and just under 20% chance of both northerly and easterly winds respectively (Figure 6).

At 3pm the wind direction appeared to be relatively evenly spread with 10% chance of winds blowing in a northerly, north easterly, north westerly, easterly, south westerly and westerly direction (Figure 7).



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Results:

The following results are averages attained from the Bureau of Meteorology from 1981 to 2010. Reviewing all information provided from figures 3 to 8 it is fair to state that during the summer months (December to February) there is significantly more wind during the summer months at both 9am and 3pm compared to the winter months.

According to the statistics from BoM, over a 31-year period the mean 9am wind speed in February is approximately 19.2km/h. The mean 9am wind speed in July over the same time period is approximately 11.8km/h.

According to the statistics from BoM, over a 31-year period the mean 3pm wind speed in February is approximately 20.3km/h. The mean 3pm wind speed in July over the same time period is approximately 16.0km/h.

4 SITE PROCESSES

4.1 Equipment used on site

Machinery and equipment in use on the site consists of:

- Wheel loader
- Jaw crusher
- Screener
- Impactor crusher
- Excavator
- Water Cart

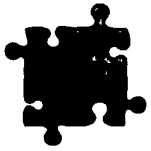


5 CONTROL MEASURES

SERS, in consultation with Brikmakers, have reviewed current dust management practices, the above mentioned method and materials for dust suppression, and have developed control measures to further mitigate dust on site during activities.

4.1 Administrative

1	<i>Employee Inductions</i>
	Employees are to be made familiar with all dust prevention measures to be implemented on-site. Dust prevention measures appropriate to forecasted working conditions are to be highlighted at the toolbox meeting each day
2	<i>Dissemination of control measures</i>
	Introduced Management Measures be explained to all employees at toolbox meetings.
3	<i>Patrol of Site boundaries</i>
	Site supervisor and employees to maintain vigilant watch over site boundaries to detect errant dust. If observed, to be reported to site supervisor immediately for implementation of remedial measures. During periods of hot, dry weather and high wind forecasts all staff shall actively patrol site boundaries at least every 3 hours. Staff must confirm that all dust suppression systems are functioning adequately to prevent dust from leaving site boundaries.
4	<i>Feedback</i>
	Information regarding any feedback both positive and negative from community consultants or employees and contractors must be documented and passed onto the Site supervisor for review and action as soon as possible.

**SERS**Site Environmental and
Remediation Services**5.2 Measures to enact should dust be observed crossing site boundary**

5	<i>Stop work</i>
	Site activities are to cease immediately if dust is observed crossing site boundaries. Should unforeseen conditions arise that cause visible dust to be generated at levels that allow it to be observed approaching or crossing site boundaries, the activities responsible must be immediately identified, all activities halt as the site supervisor is notified. Only once the cause of dust suppression failure has been identified and rectified should site activities re-start.

5.3 Prevention of nuisance dust at the source

6	<i>Site watering</i>
	Water is to be used for dust suppression within the site. The water will be sourced from the main supply. In the event of a water shortage for dust suppression, water can be immediately brought onto site using a tanker truck.

5.4 Measures to prevent dust uplift

7	<i>Access-ways</i>
	On-site haul roads and access-ways are regularly dampened by the water cart. A 10km/h speed limit is implemented on-site, regulated by all Site staff and enforced by the Site Supervisor.
8	<i>Loading of vehicles</i>
	Drop heights from loader buckets and the transport vehicle must be kept to a minimum
9	<i>Transportation of materials</i>
	Truck loads will be securely covered with canvas material to prevent any dust escaping
10	<i>Stockpiling of materials</i>
	Stockpiling area located away from the Site boundary. Materials will be stockpiled in grades and types by the use of a wheeled loader and earthmoving equipment.



5 CONCLUSION

It is the opinion of SERS, in consultation with Brikmakers, that the implementation of control measures outlined in this document when implemented will successfully mitigate dust generation on-site.

In reviewing the Emission Ricks Matrix below taking into consideration of the measures put in place through this management plan, the risk rating for the dust emissions from the works being undertaken is now viewed as Low

Table 1- Emissions Risk Reduction Matrix

		Relative proximity of the interested party with regards to the emission				
		Immediately Adjacent	Adjacent	Nearby	Distant	Isolated
Level of Community Interest or Concern	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Relative proximity of the interested party with regards to the emission	Nearby
Level of Community Interest or Concern	2

This Dust Management Plan is subject to ongoing review, as it is the aim of Brikmakers to achieve continuous improvement in this area of operation. The latest innovations in best management techniques will be considered for possible integration into this dust management plan as they become readily available.

Implementation of the measures discussed in this report shall reduce the risk of dust onsite from moderate to low.



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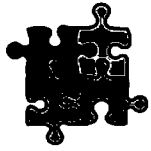
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Figures



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Figure 1 – Site Location and buffer



FIGURE : Site Location and Buffer zone



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Job No: Walyunga Road
Address: Lot 5 (91) Walyunga Road

Scale: 1:10,000
Original size: A3
Imagery from: 11/10/13
Source: Nearmap

Date drawn: 10/05/16
Revision: 0
Drawn by: A.C.
Checked by: A.R.



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File: N:\A SERS\GIS\Projects\ Bullsbrook\ Lot 5 Walyunga Clay Pit MXD\Fig 1 - Site Location

Legend

- Lot Boundary
- ClayBoundary_1000m
- ClayBoundary_500m
- ClayBoundary_150m
- AccessRoute
- Clay and Schist extraction- Extension
- BushForever
- residents



Figure 2 – Extraction Site Layout



FIGURE : Proposed Extraction Site Layout



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Job No: Walyunga Road
Client: Stargaze Asset Pty Ltd
Address: Lot 5 (91) Walyunga Road

Scale: 1:8,000
Original size: A3
Imagery from: 09/10/13
Source: Nearmap

Date drawn: 11/05/16
Revision: 0
Drawn by: K.S.
Checked by: A.R.



Legend

Lot Boundary Operational Cells

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File: N:\A SERS\GIS\Projects\Walyunga Road clay pit fill\MXD\Fig 2



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**Figure 3 – Average monthly wind speeds over the
year at 9am in summer and winter**



[Bureau Home](#) > [Climate](#) > [Climate Data Online](#) > [Monthly Statistics](#)

Climate statistics for Australian locations

Monthly climate statistics - graph

[About Climate statistics](#) | [Data file of statistics for this site \(csv\)](#) | [Site selection menu](#)

PERTH AIRPORT

Mean 9am wind speed (km/h)

Site details

Site name: PERTH AIRPORT

Latitude: 31.93 °S

Longitude: 115.98 °E

Site number: 009021

Elevation: 15 m

Commenced: 1944

Operational status: Still Open

Yearly data

30 year statistics

Comparison site

First statistic

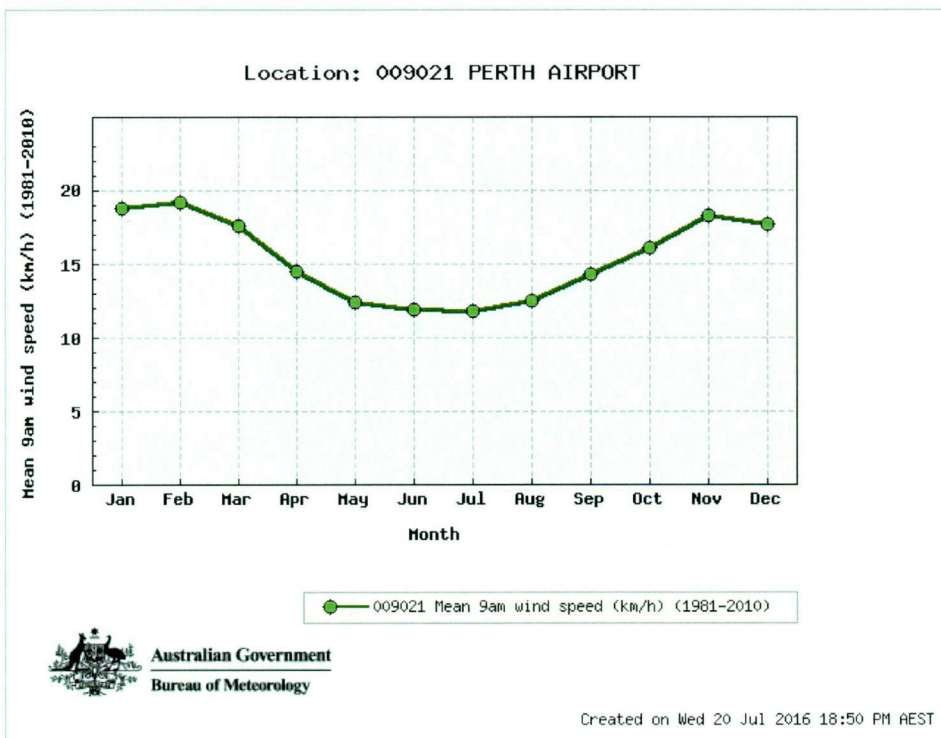
Second statistic

Note: Only one option can be redrawn at a time

Include data for the year:

2010

Redraw >>



Statistics

Mean 9am wind speed (km/h) for years 1981 to 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean 9am wind speed (km/h) for years 1981 to 2010	18.8	19.2	17.6	14.5	12.4	11.9	11.8	12.5	14.3	16.1	18.3	17.7	15.4	31
													12.3	= Not quality controlled

DO NOT SCALE

NOTES:



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CLIENT:

Brikmakers

PROJECT:

Dust Management Plan,
Lot 5 Walyunga Road, Bullsbrook

TITLE:

Monthly wind variance over 12 months
at 9am

SCALE@SIZE:

NTS

ISSUE:

FINAL

DESIGN/DRAWN:

KS - BoM website

DATE:

20/07/2016

PROJECT No:

004_4_EIL_Extension
_Dust

DRAWING No:

Plate 1

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**Figure 4 – Average monthly wind speeds over the
year at 3pm in summer and winter**



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Monthly climate statistics - graph

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PERTH AIRPORT

Mean 3pm wind speed (km/h)

Site details

Site name: PERTH AIRPORT

Latitude: 31.93 °S

Longitude: 115.98 °E

Site number: 009021

Elevation: 15 m

Commenced: 1944

Operational status: Still Open

Yearly data

30 year statistics

[Comparison site](#)

[First statistic](#)

[Second statistic](#)

Note: Only one option can be redrawn at a time

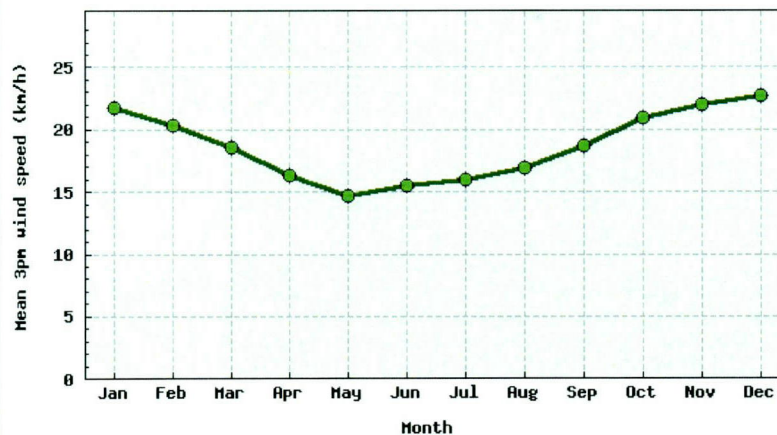
Include data for the year:

2010

Redraw

>>

Location: 009021 PERTH AIRPORT



009021 Mean 3pm wind speed (km/h)



Australian Government
Bureau of Meteorology

Created on Wed 20 Jul 2016 13:58 PM AEST

Statistics

Mean 3pm wind speed (km/h) for years 1944 to 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean 3pm wind speed (km/h) for years 1944 to 2010	21.7	20.3	18.6	16.3	14.7	15.5	16.0	16.9	18.7	20.9	22.0	22.7	18.7	67

12.3 = Not quality controlled

DO NOT SCALE

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CLIENT:

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Monthly wind variance over 12 months
at 3pm

SCALE@SIZE:

NTS

ISSUE:

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DATE:

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PROJECT No:

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Plate 2

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Figure 5 – Wind frequency data during summer at 9am

Location: PERTH AIRPORT

Latitude: 31.93°S

Period: 9am February

Download: [PDF](#) | [Wind Frequency Data](#)

Longitude: 115.98°E

Start year: 1944

Site Number: 009021

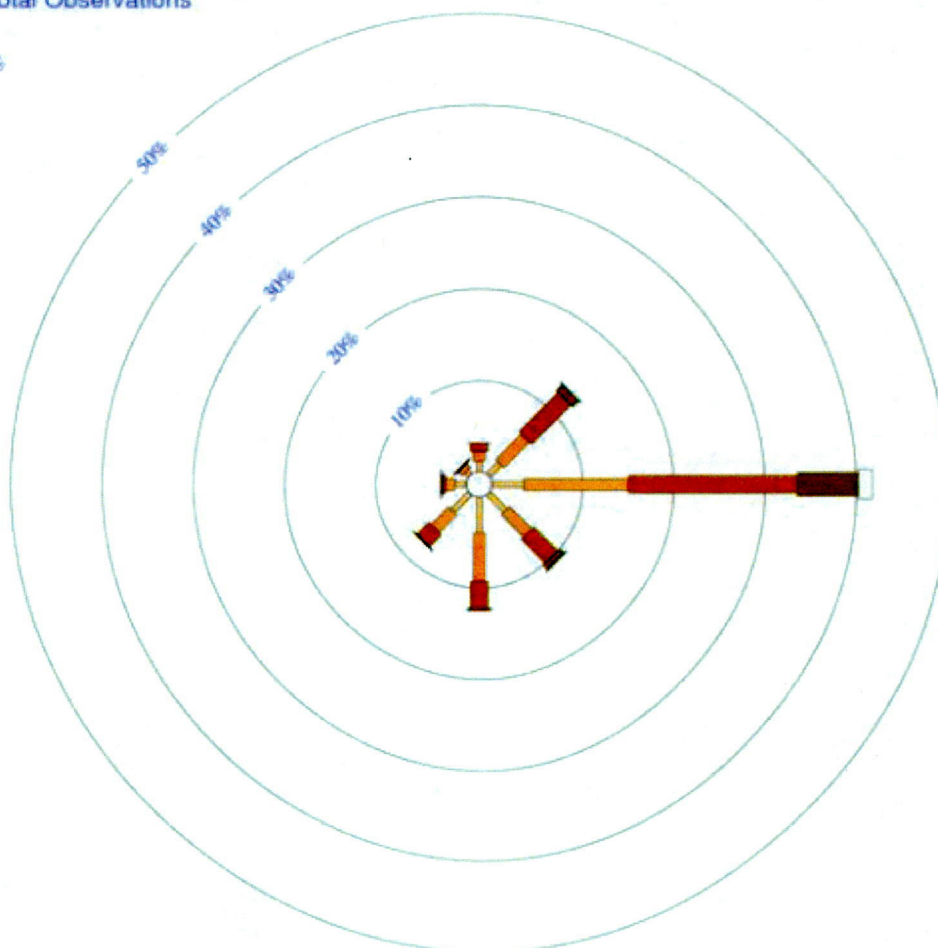
Elevation: 15 metres (above sea level)

End year: 2016



9 am Feb
2033 Total Observations

Calm 7%



Australian Government
Bureau of Meteorology

Wind directions are divided into eight compass directions. The circles around the image represent the various percentages of occurrence of the winds. For example, if the branch to the west just reaches the 10% ring it means a frequency of 10% blowing from that direction. The scale factor can be ignored when interpreting these wind roses.

An observed wind speed which falls precisely on the boundary between two divisions will be included in the lower range (eg 10km/h is included in the 1-10 km/h range).

Calm has no direction. An asterisk(*) indicate that calm is less than 1%.

Only quality controlled data have been used.

Image last updated April 2016



**Figure 6 – Wind frequency data during summer at
3pm**

Location: PERTH AIRPORT

Latitude: 31.93°S

Period: 3pm February

Download: [PDF | Wind Frequency Data](#)

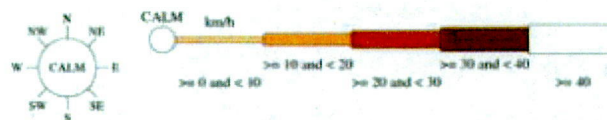
Longitude: 115.98°E

Start year: 1944

Site Number: 009021

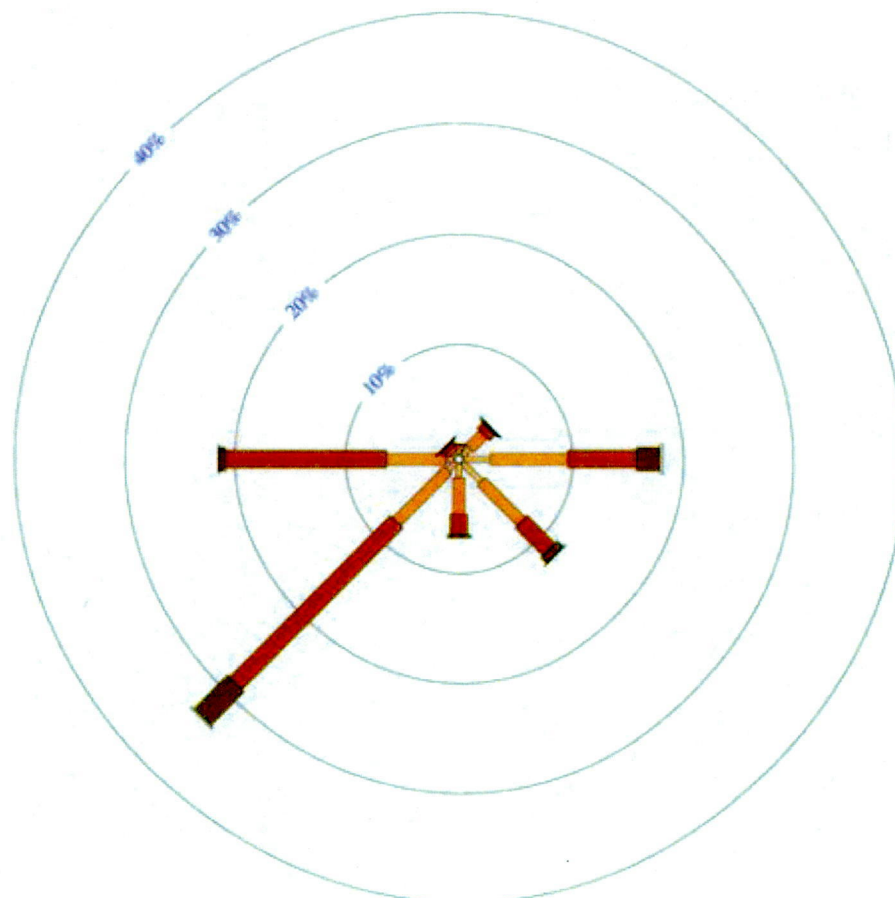
Elevation: 15 metres (above sea level)

End year: 2016



3 pm Feb
2031 Total Observations

Calm 2%



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Wind directions are divided into eight compass directions. The circles around the image represent the various percentages of occurrence of the winds. For example, if the branch to the west just reaches the 10% ring it means a frequency of 10% blowing from that direction. The scale factor can be ignored when interpreting these wind roses.

An observed wind speed which falls precisely on the boundary between two divisions will be included in the lower range (eg 10km/h is included in the 1-10 km/h range).

Calm has no direction. An asterisk(*) indicate that calm is less than 1%.

Only quality controlled data have been used.

Image last updated April 2016



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Figure 7 – Wind frequency data during winter at 9am

Location: PERTH AIRPORT

Latitude: 31.93°S

Period: 9am July

Download: [PDF](#) | [Wind Frequency Data](#)

Longitude: 115.98°E

Start year: 1944

Site Number: 009021

Elevation: 15 metres (above sea level)

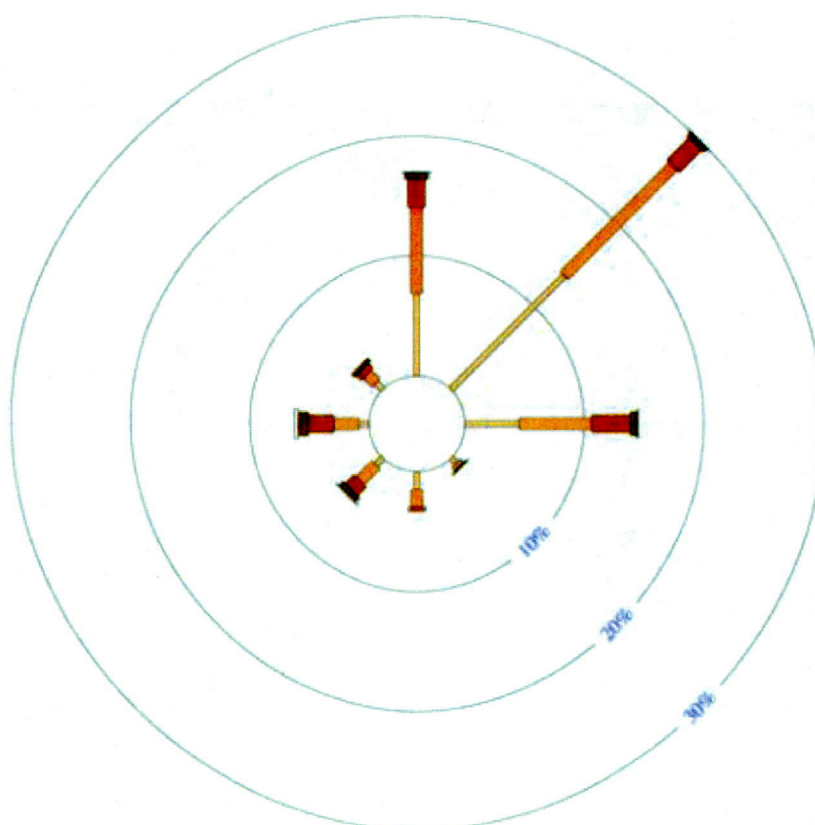
End year: 2016



9 am Jul

2231 Total Observations

Calm 20%



Australian Government

Bureau of Meteorology

Wind directions are divided into eight compass directions. The circles around the image represent the various percentages of occurrence of the winds. For example, if the branch to the west just reaches the 10% ring it means a frequency of 10% blowing from that direction. The scale factor can be ignored when interpreting these wind roses.

An observed wind speed which falls precisely on the boundary between two divisions will be included in the lower range (eg 10km/h is included in the 1-10 km/h range).

Calm has no direction. An asterisk(*) indicate that calm is less than 1%.

Only quality controlled data have been used.

Image last updated April 2016



SERS

Site Environmental and
Remediation Services

Figure 8 – Wind frequency data during winter at 3pm

Location: PERTH AIRPORT

Latitude: 31.93°S

Period: 3pm July

Download: [PDF](#) | [Wind Frequency Data](#)

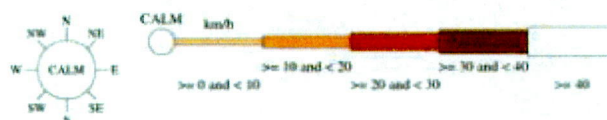
Longitude: 115.98°E

Start year: 1944

Site Number: 009021

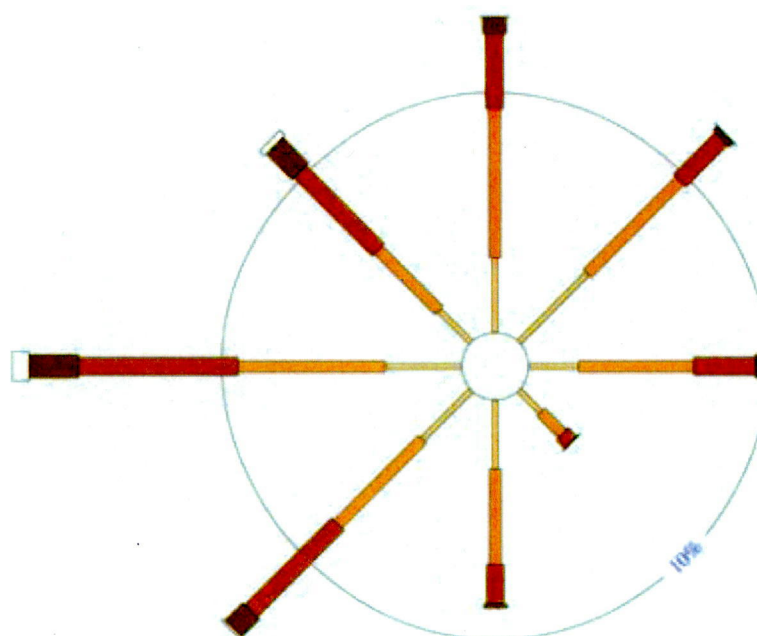
Elevation: 15 metres (above sea level)

End year: 2016



3 pm Jul
2233 Total Observations

Calm 7%



Australian Government
Bureau of Meteorology

Wind directions are divided into eight compass directions. The circles around the image represent the various percentages of occurrence of the winds. For example, if the branch to the west just reaches the 10% ring it means a frequency of 10% blowing from that direction. The scale factor can be ignored when interpreting these wind roses.

An observed wind speed which falls precisely on the boundary between two divisions will be included in the lower range (eg 10km/h is included in the 1-10 km/h range).

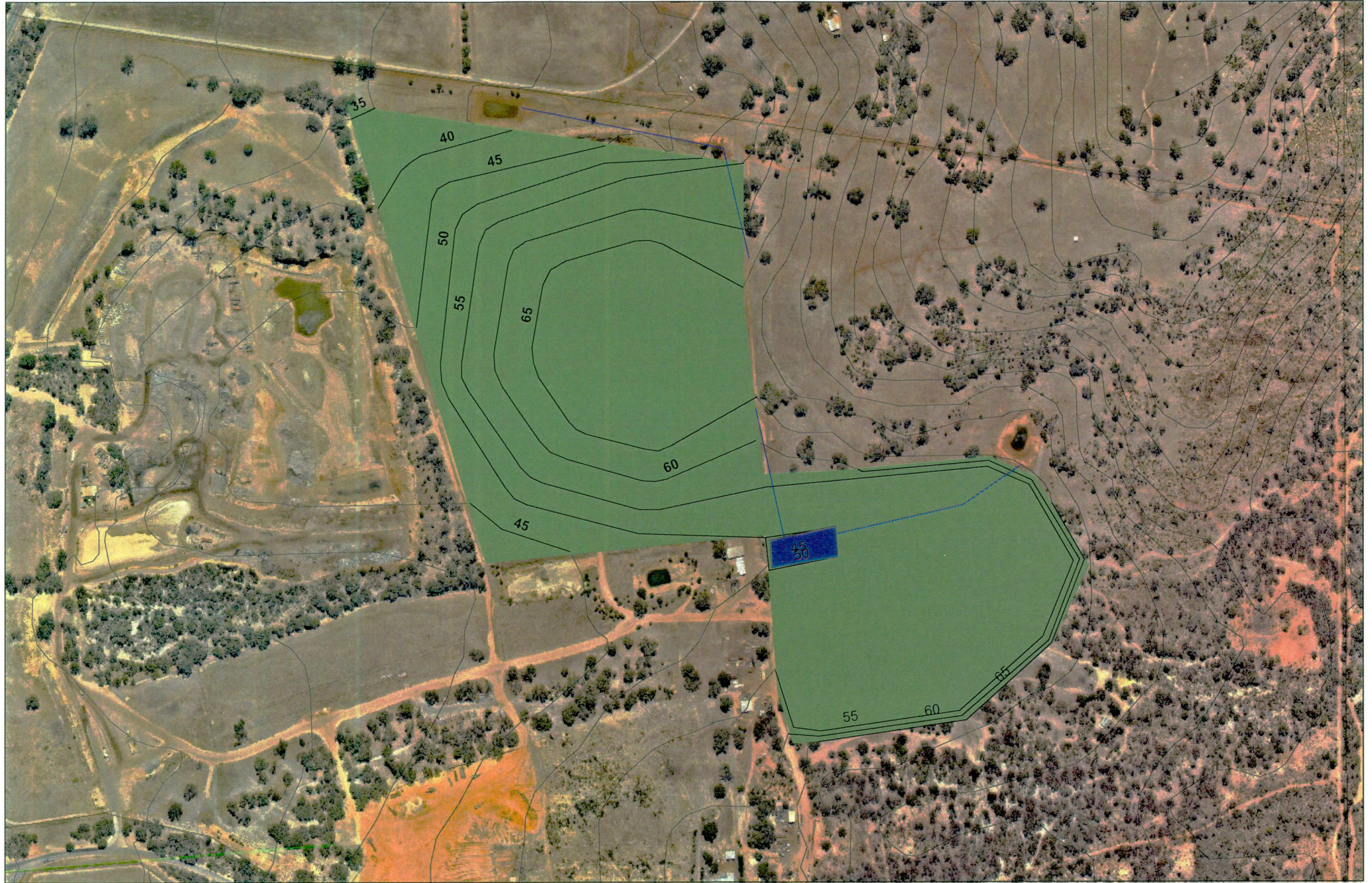
Calm has no direction. An asterisk(*) indicate that calm is less than 1%.

Only quality controlled data have been used.

Image last updated April 2016



Figure 9 – Finished landform of Site

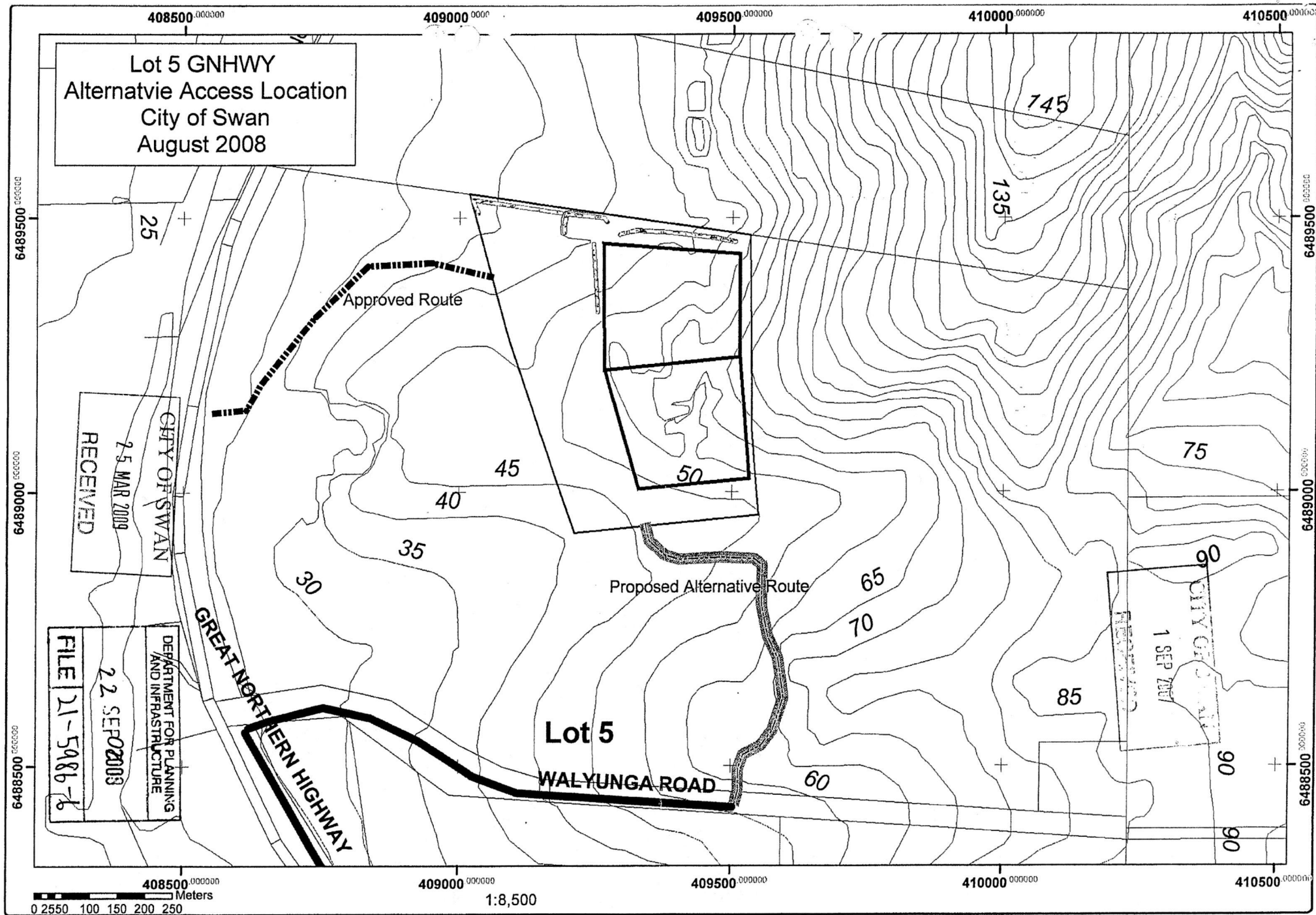


0 100 200 400
Meters



1:4,000

Proposed Finished Landforms - Walyunga Road



Lot 5 GNHWY
Alternatvie Access Location
City of Swan
August 2008

FILE 21-5986-6
22 SEP 2003
DEPARTMENT FOR PLANNING
AND INFRASTRUCTURE
0058849

