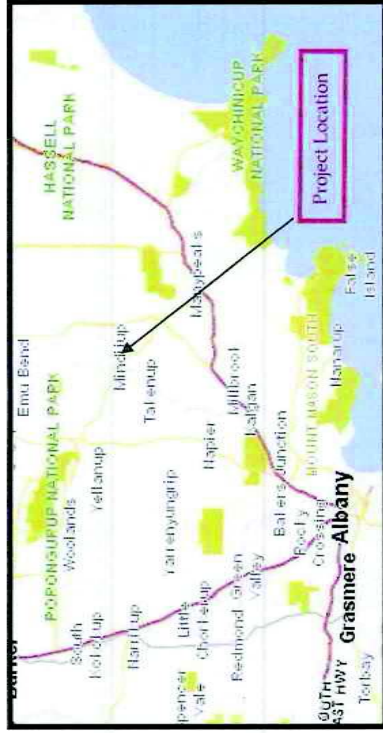


INTRODUCTION

The owner of Lot 102 on Plan 22860, Martin Shuttleworth (attached) wishes to clear approximately 39ha of remnant native vegetation for an extractive industry. The property is situated approximately 30km NE of Albany on Mindijup Road (Figure 1).



Portions of the property has been cleared for approximately 50 years, with clearing mainly confined to the higher grazing productivity areas underlain with gravels and heavier soils. Some patches of deep sand have been cleared previously but generally the clearing of the property has left such areas under remnant vegetation. Other remaining areas of remnant vegetation include major drainage lines and granitic/lateitic outcrops that are otherwise unsuitable for agriculture.

A portion of the property contains a Covenant to Reserve under the Soil and Land Conservation Act 1945 (attached) but the affected land is on the northern portion of the current lot and does not interfere with this proposal.

The property is approximately 583ha in total with some 175ha of remnant vegetation remaining – 136ha if this application is approved. The extent of the applied for clearing is shown in Figure 2 and confined to the southern portion of the property.

Portions of the property are used for commercial purposes by businesses owned by the Landowner, specifically a large Commercial Composting operation and Inert Waste Disposal, licensed by DER and approved by the Local Authority. Further information can be sought by searching DER Works Approval W5573/2013/1. The proposed clearing lies within the Prescribed Premises boundary.

The owner also operates a local earthmoving firm (Great Southern Sands) which is the principal supplier of high quality concrete and construction sand in the Albany region. The sand used for this purpose is nearing exhaustion on the cleared areas of the property or is commercially unsuitable due to the presence of clay layers, concrete and plastering sand having a very strict upper limit for clay content.

CLIMATE

The Albany/Manypeaks area is subject to mild Mediterranean with warm to hot dry summers and cool wet winters. July is the coolest wettest month with an average of 15.7°C maximum and 8.1°C minimum,

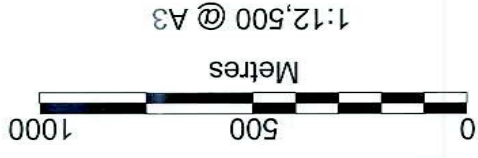


Figure 2. Proposed clearing (red hatched) - Lot 102 on Plan 22860. Remaining native vegetation (136.2ha) shown outlined.



with over 100 mm of rainfall. February is the hottest month with an average of 22.9°C maximum and 15.4°C minimum and along with January is one of the driest months. The site receives an average approximately 703mm of rain per annum.

Winds are predominantly from the east and south-east in the summer and from the west and north-west in the winter. The weather patterns are driven by winter low and summer high pressure systems. The relatively low evaporation rates and moderate temperatures during winter contribute to a growing season for primary production of approximately 8 months – mid March to early November.

REGOLITH

The underlying geology of the site is a complicated vertical and horizontal sequence of Eocene marine sediments, unconformably overlying Proterozoic granite, and metamorphic rocks, variously weathered.

The higher portions of the landscape are covered in variably deep, very well sorted pale siliceous sands deposited by Aeolian processes on an undulating erosional surface of ancient soils, Eocene sediments etc.

This soil type is classified for agricultural purposes as pale Deep Sand. This is “sand <80cm deep with white, grey or pale yellow topsoil. Coffee rock, clay or ferricrete may occur at >80cm”. Pale Deep Sands have poor fertility, water holding characteristics and are found to be scattered throughout the south west of Western Australia.

Extensive drilling, both auger and RAB/RWB (rotary air and waterblast) on the site has been carried out to ‘prove up’ the sand resource prior to making this application, and the results are mapped in Figure 3 with a potential sand resource up to 10m deep. It is these deep sands that are being targeted by the mining operations on the neighbouring lease to the south. The material on the mining lease is exported as a very high quality silica sand for the production of computer chips, high quality glassware etc.

FLORA AND FAUNA CONSIDERATIONS

The application covers an area of *Banksia/Allocasuarina* /jarrah shrub and heath land, typical of the deep sands found in the Albany area. A detailed flora and fauna study has not been carried out for this proposal but a detailed study is available for the mineral sand mine immediately to the south of the property and is attached in full for reference. The vegetation types and fauna are expected to be identical to that found on Lot 102 with the exception of the seasonally waterlogged soils mapped in that report which do not occur on Lot 102.

The principal species are:

Species	Common name
<i>Adenanthos cuneatus</i>	Coastal jug flower
<i>Allocasuarina Fraseriana</i>	sheoak
<i>Banksia grandis</i>	bull Banksia
<i>Banksia ilicifolia</i>	Holly-leaved Banksia
<i>Daviesia sp.</i>	
<i>Eucalyptus Staeri</i>	Albany Blackbutt
<i>Eucalyptus marginata</i>	Jarrah
<i>Melaleuca sp.</i>	
<i>Nuytsia floribunda</i>	West Australian Christmas tree
<i>Pattersonia sp.</i>	
<i>Sollya fusiformis</i>	Blue bell creeper
<i>Stylidium sp.</i>	



There are a number of environmental weeds located on the property and in more disturbed areas of the bushland as follows:

Botanical Name	Common Name	Category
<i>Phytolacca octandra</i>	Ink weed	Priority 1, prohibit movement
<i>Hypochaeris radicata</i>	Flat Weed	Environmental weed
<i>Pennisetum clandestinum</i>	Kikuyu	No category
<i>Avena spp.</i>	Wild Oat	No category
<i>Arctotheca calendula</i>	Cape Weed	No Category

The first species on this list is difficult to control as it is found in high numbers through the local area where ever disturbance or low active management (ie. Tree plantations) occurs. Seedlings are occasionally observed in the bushland where the palatable seeds (to birds) are spread in droppings.

GROUNDWATER

There is a water monitoring bore located adjacent to the composting facility which was installed in 1997 and reaches to a depth of 1.7m. No water table levels have been recorded during this period of time.

Deep RAB/RWB drilling in July 2012 downslope from the proposed clearing did not encounter any significant groundwater other than that expected during the winter months on small perched aquifers close to the surface.

Lot 102 is not located in a priority surface or groundwater protection area.

HERITAGE

A search of the Department of Indigenous Affairs (DIA) Heritage Survey database for Aboriginal sites and surveys in the subject area identified that there are no sites or surveys currently registered.

RESOURCE

As previously mentioned the prime purpose of this application is to access a sand resource underlying the vegetation. This resource is contiguous to the sand resource mined on the property to the south and although not expected to be of export quality, it is eminently suitable for local construction supply.

The owner of the property owns a local earthmoving firm (Great Southern Sands) which is the principal supplier of high quality concrete and construction sand in the Albany region. The sand used for this purpose is nearing exhaustion on the cleared areas of the property.

The results of the drilling are given in Figure 3 and attached (bore logs). The depth of resource is illustrated as isopachs from existing ground surface noting that depths are actually +0.5m to allow for topsoil and unsuitable surface materials.

The greatest depth of material generally lies under remnant vegetation and increases in depth to the south. Although there is almost certainly good resource under the patch of vegetation in the middle of Fig. 3 we would prefer not to clear this area for aesthetic reasons.

RATIONALE FOR CLEARING

It is a common first impression of the Albany area that sand resources are common but in reality sand cover is generally shallow (<1m), isolated to mid and lower valley slopes, generally of small extent or locked up in reserves by default (ie. Not suitable for agriculture and therefore remained in Crown ownership). As a result the amount of resource on cleared land in the region is rapidly dwindling, or is unavailable for environmental or regulatory reasons. There is also a large amount of 'potential' sand that is unsuitable for use in construction or concrete manufacture due to high organic matter content (ie. Valley floor materials).

EROSION PREVENTION

Despite the nature of the sand being originally deposited by wind processes, on-premise experience has shown that erosion is minor. The strongest winds experienced on the site are during the winter months during frontal passage but at this time the sands are moist and there is some grass cover to attenuate near ground wind velocity.

During summer the site is sufficiently far from the coast not to have any large effect from sea breezes, and the generally mild climate of Albany allows the continued growth a kikuyu pastures across the property.

Water erosion has never been observed even in the open pits as the hydraulic conductivity of the sand is so high.

The property is completely destocked at present and if livestock are brought back onto the property then the sand extraction area would remain de-stocked to prevent animal faeces entering the construction materials production stream.

POST EXTRACTION LANDUSES

Following extraction the site will be established as pasture. Extraction will occur basically down to a clay level which is suitable for pasture establishment once the 'topsoil' previously stripped is spread ie. Clay subsoil has sufficient water holding capacity and nutrient retention for pasture.

Remnant vegetation types could not be reasonably established due to the close proximity of pastures and weeds, and additionally the soil types left will be quite different to that which originally existed.

The remaining vegetation on the property compared to overall cleared land is well above the average for the surrounding district.



Figure 3. Enlargement of affected area given in Fig.2 Sand resource isopachs shown in yellow. Drill locations marked by X, RAB/RWB drilling indicated by red circles (numbered).

