

**Extractive Industry Application
and
Management Plans**

**No. 148 Mount Leewin Loop Road
Carlotta, Shire of Nannup**



Prepared for
Worthy Contracting



By



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1. Introduction

Abrus Consulting Pty Ltd (Abrus) has been engaged by Worthy Contracting to prepare a Development Application for an extension to the existing extractive industry located at Lot 101. No. 148 Mount Leewin Loop Road, Carlotta, in the Shire of Nannup, which the proponent will lodge. The Shire of Nannup Local Planning Strategy supports the sustainable extraction of minerals and basic raw materials provided the proposal suitably addresses environmental, land use compatibility, access, landscape and other relevant planning considerations. The aim of this document is to address these components and provide the shire of Nannup with relevant information to approve this proposal.

The proposed extractive industry consists of continuing operating a previously approved gravel pit, with no further proposed expansion. Given past year extractions, the revised approximate capacity of the gravel quarry is 100,000 TPA for the requested 15 year lifespan. This is an owner-operated gravel pit.

This is an existing gravel pit which provides the owner and supplies additional contractors with base-course gravel and rocks, which is primarily used for roadworks and domestic clients in the Shire. The current pit and areas to still develop are located on cleared farmland. The original approval for the application for extractive industry was approved by the Shire of Nannup Council in October 2003, and the approval was for a period of 15 years. The second approval granted by the Shire of Nannup was in November 2020, for a period of 5 years. As no further expansion or changes to resource extraction methods are proposed, there is a 15 year anticipated completion date for productive excavation, hence the 15 year approval request.

There will be no clearing of native vegetation to expand the gravel pit into the previously approved areas as the area proposed for extraction is cleared pasture for agricultural purposes. Road access is well established and maintained.

Supporting documentation with this Report include:

- Emergency Management Plan;
- Dust Management Plan; and
- Drainage Management Plan.

1.1 Proponent

The Proponent is Worthy Contracting and the gravel pit is located on farmland owned by Benjamin Worthington.

Postal Address
PO Box 133
Nannup Western Australia 6275

Primary Contact
Benjamin Worthington
Owner/Operator
Phone: 0427190398
Email: bworthington4576@gmail.com

1.2 Consultant

Abrus Consulting Pty Ltd is an Environmental Management Consultancy, specialising in environmental approvals, project management, environmental management plans associated environmental documentation and Aboriginal liaison.

Postal Address:
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Nannup WA 6275

Primary Contact
Rachael Wedd
Director
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2. Property Description and Locality

2.3 Background

The current pit, plus extension are located on cleared farmland. The original approval for the application for extractive industry was submitted by the then owners of the property, Barry, Shirley and Laurence Worthington and was approved by the Shire of Nannup Council in October 2003, with the approval period of fifteen years. With this approval, Benjamin Worthington (owner/operator of Worthy Contracting) commenced gravel extraction on the eastern side of the property.

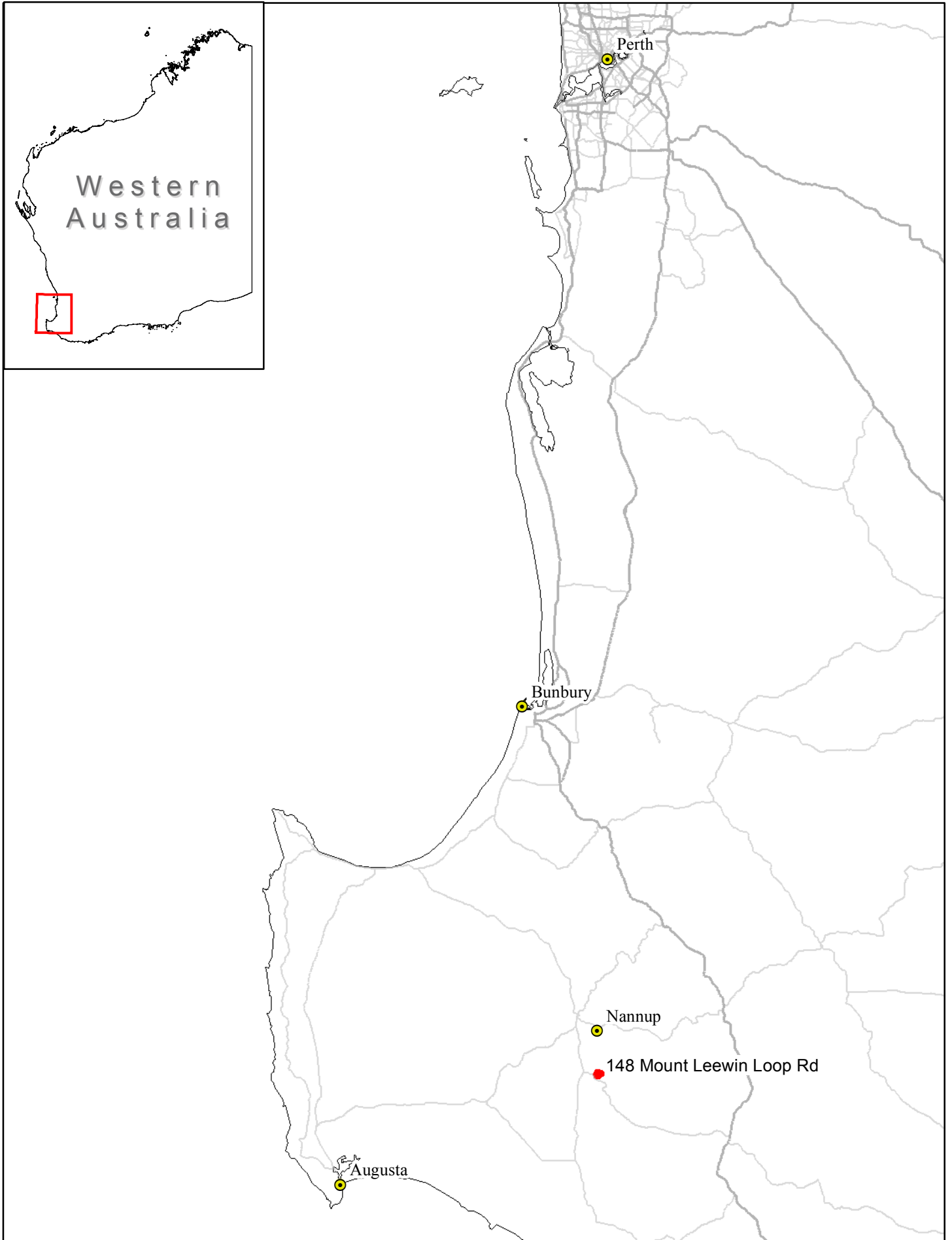
In 2006 the property was subdivided into three Lots, including the Lot which is the subject of this Application. In 2009 with the change in land ownership within the approval period for the extractive industry, the approval was transferred to the current landowner of Lot 101, Benjamin Worthington.

In 2012 a Valuation Report by LMW Hegney was prepared, which includes a section on Environmental and Cultural Issues for the site. This report concluded that no environmental issues were apparent (including noxious weeds or chemical residues), that there were no Aboriginal Sites and Heritage implications and that the property was not subject to flooding. All buildings (including the workshop/shed) were all of a sound nature. In October 2019 a site visit was conducted by Abrus Consulting. Although not an audit or survey, no environmental issues were noted at the current or proposed extraction site.

The second approval granted by the Shire of Nannup was in November 2020, for a period of 5 years. No environmental issues have been noted by the owner operator. The current Certificate of Title and Survey for 148 Mount Leewin Loop Road are presented in Appendix A.

2.4 Site Location

The proposed gravel quarry is located approximately 18 km south of Nannup township, on Lot 101, Number 148 Mount Leewin Loop Road, Carlotta (Plan 65066). This property is comprised of 55.251 hectares (ha) and is primarily used for agricultural purposes (ie grazing) and a gravel extractive industry. It is considered to be approximately 73% cleared for well established pasture and the gravel pit (total of 40.251 ha) and with approximately 15 ha of remnant native vegetation. The property is situated on the eastern side of Mount Leewin Loop Road and is 1.4km from the junction with Graphite Road. Lyon Road is located to the north, which is a no-through road and is used to access Lot 102 and Lot 103. See locality Figure 1. Access is directly off Mount Leewin Loop Road. The southern gateway (No. 100 Mount Leewin Loop Road) is the primary access to both the workshop/site office and the gravel extraction site.



0 10 20
km

Coordinate System:
GDA 94 MGA Zone 50



No. 148 Mount Leewin Loop Road
Development Application
Figure 1 Location Plan

DRAWN	CNH	DATE	6/11/2019
CHECKED	RW	DATE	6/11/2019
SCALE	1:1,158,771		A4
PROJECT No.	FIGURE No. 1		

2.5 Zoning

The site and surrounding areas are zoned as “Agricultural Priority 2”. The operation of an Industry Extractive means cannot be permitted in this zoning unless Council has granted the planning approval in accordance with Section 4.6 in the Shire of Nannup Local Planning Strategy.

2.6 Surrounding Land Uses

The proposed gravel pit area is surrounded by agricultural land, forestry plantations, and lifestyle. In a wider context this area is within a few kilometres of State Forest (South East Nannup State Forest to the east and north, and Barlee Brook and South East Nannup State Forests to the south).

2.7 Nearest Residences




The EPA Guideline Separation Distances between Industrial and Sensitive Land Uses (No. 3, June 2005) requires a minimum separation of 1000m between sensitive land use and extraction/screening works. The nearest residence is located approximately 417m to the east of the current pit area, and approximately 198m from the edge of the new pit, and is owned by Sally Edwards. The Proponent has a good relationship with the owner of the residence and although an agreement had been made previously to create a sound/visual barrier (2.5-3m high and 100m in length) if required to reduce any potential sound disturbance or dust emissions, due to the depth and angle of the pit this has not been requested to be constructed to date. The neighbour has not made any complaints to the proponent, but the barrier will be constructed if requested by the neighbour.

The distance to the owners residence from the current active gravel pit area is approximately 243m. This is not considered to be a sensitive land use. The next nearest residence is approximately 745m from the active gravel pit area. The owners of this property are primarily absent from the property and have made no complaints to the Proponent.




The next residence is approximately 1,226m from the active gravel pit area which is outside of the EPA separation distance requirement.

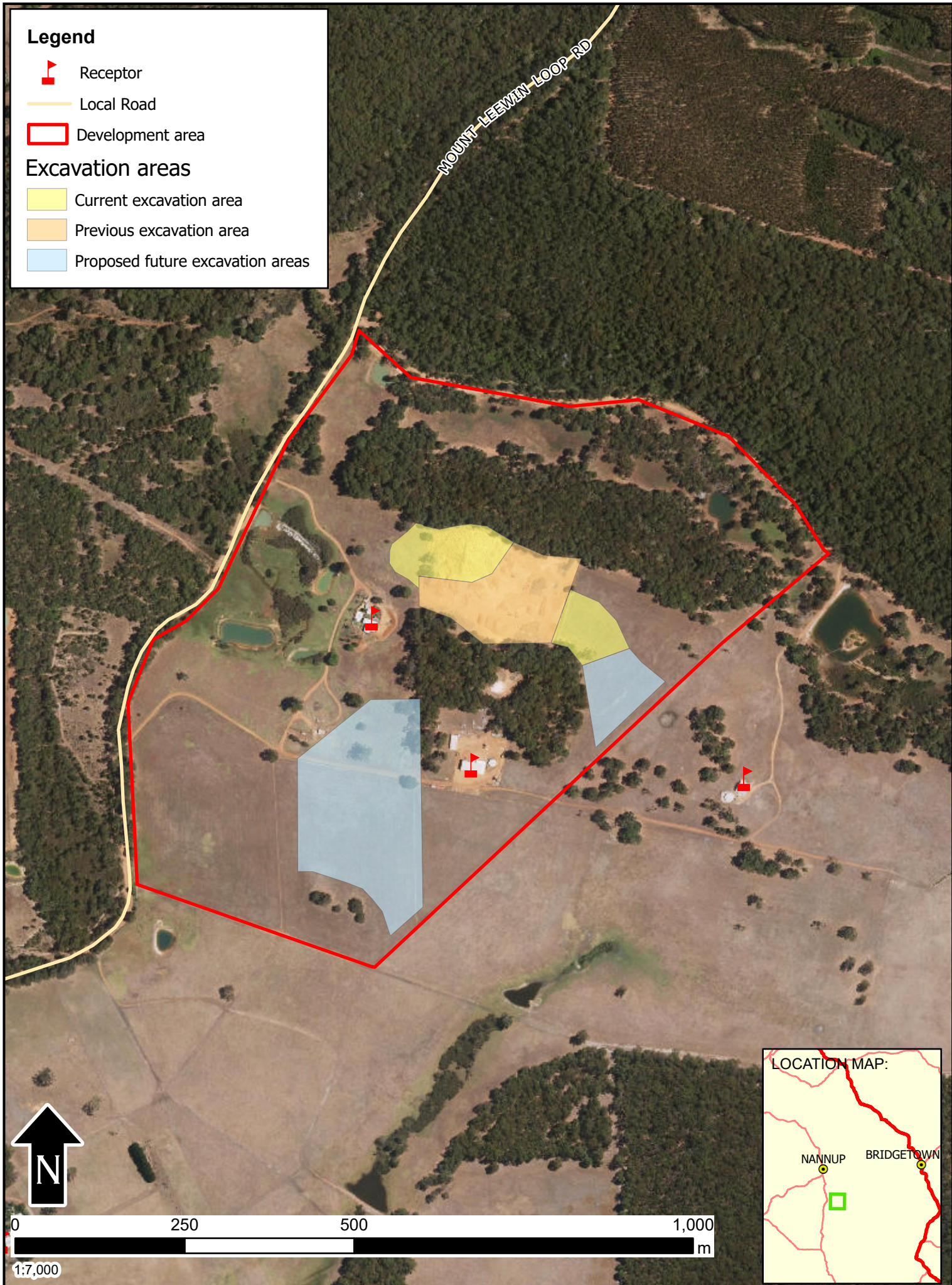
Please refer to Figure 2.

Legend

-  Receptor
-  Local Road
-  Development area

Excavation areas

-  Current excavation area
-  Previous excavation area
-  Proposed future excavation areas



Sources: Landgate SLIP, MRWA, Esri and the GIS User Community



No. 148 Mt Leewin Loop Road CARLOTTA WA
Development Plan - Local Receptors

Figure: 2
Project:

Drawn: CNH
Date: 23/03/2026

Coordinate System:
GDA2020 MGA Zone 50

2.8 Services and Infrastructure

The property has electricity and telephone services connected, however there is no scheme water supply available in the area so all water is supplied onsite. Several dams onsite provide water for dust suppression, fire suppression and associated works requirements. The domestic water supply is via rainwater tanks. There is also a seasonal (winter) running creek line system. There is a primary residence and a substantial detached workshop.

The property is fully fenced externally and has sound internal fencing comprising standard timber/steel post and ring-lock wire with a top rung of barbed wire. The gravel pit is fenced with double gates (with padlock). No new or additional services will be required during the operation or rehabilitation of the site and there will be no impact or disruption of existing services from extraction or transportation of material from the pit area.

2.9 Mobile Plant and Vehicles

Plant and vehicles used for the excavation operations include:

- 996 Ford L75 9000 Tipper Body Rigid Truck
- 1982 Ford 12T Tipper Body Rigid Truck – with Water Tank attachment (see below)
- 1982 Ford Water Truck (Tank Capacity 10,500L)
- 2002 Iveco PowerStar Prime Mover
- 1977 Custom Built Low Loader 3 Axle Semi Trailer
- 1997 Iveco Prime Mover
- 1998 Kobelco SK200 KV Excavator – with various attachments/accessories
- 1993 Komatsu D57S Traxcavator
- 1987 Caterpillar 931B Traxcavator
- 1990 Samsung SL180 Front End Loader
- 1986 Caterpillar D7G Bulldozer
- 2005 Komatsu PC220-7TH Excavator – With various attachments/accessories
- 2002 Volvo A25D Dump Truck
- 2005 S250 Bobcat Skid -Steer Loader – with various attachments
- 1991 TCM FG10 Forklift
- 2008 GXL Toyota Landcruiser Utility
- Holden Rodeo Utility
- Mobile Screening Plant (Gravel Pit)
- Water Trailer

3. Environmental Background

3.1 Climate

Located just south of the township of Nannup, the climate of Nannup is classed as warm and temperate (Mediterranean), with warm dry summers and cool wet winters. The average annual temperature is 15.8°C, with most rain in the winter and drier summers. The average annual rainfall of Nannup is 923mm with most rainfall occurring between May and September (Churchward, 1992). The warmest months are January and February, with the coldest months being July and August.

3.2 Vegetation

The area under application is predominately pasture. Surrounding land use is Agricultural with State Forest located several kilometres from the site (South East Nannup State Forest to the east and north, and Barlee Brook and South East Nannup State Forests to the south). On the north side of the current gravel pit there is remnant bush which is primarily Jarrah, Marri and Blackbutt (left as a natural buffer zone and habitat corridor) which is typical of the vegetation in the area.

3.3 Flora and Fauna

A desktop EPBC search was undertaken for the previous Development Application in relation to flora and fauna. Given that the area has been cleared for agricultural purposes for a considerable many years and that there have been no other changes to land use, it is considered highly unlikely that any plants or animals of conservation significance will be present on the property.

Various cockatoos may utilise some of the trees on the northern section of the property. Some of these animals may also be present in the nearby State Forest. No impact on any of these species from operational activities is anticipated. In the unlikely event that any of these listed animals are injured from operational activities (ie collision with a vehicle) the animal will be taken to the nearest wildlife carer (due to the Nannup veterinary services only being manned two afternoons per week).

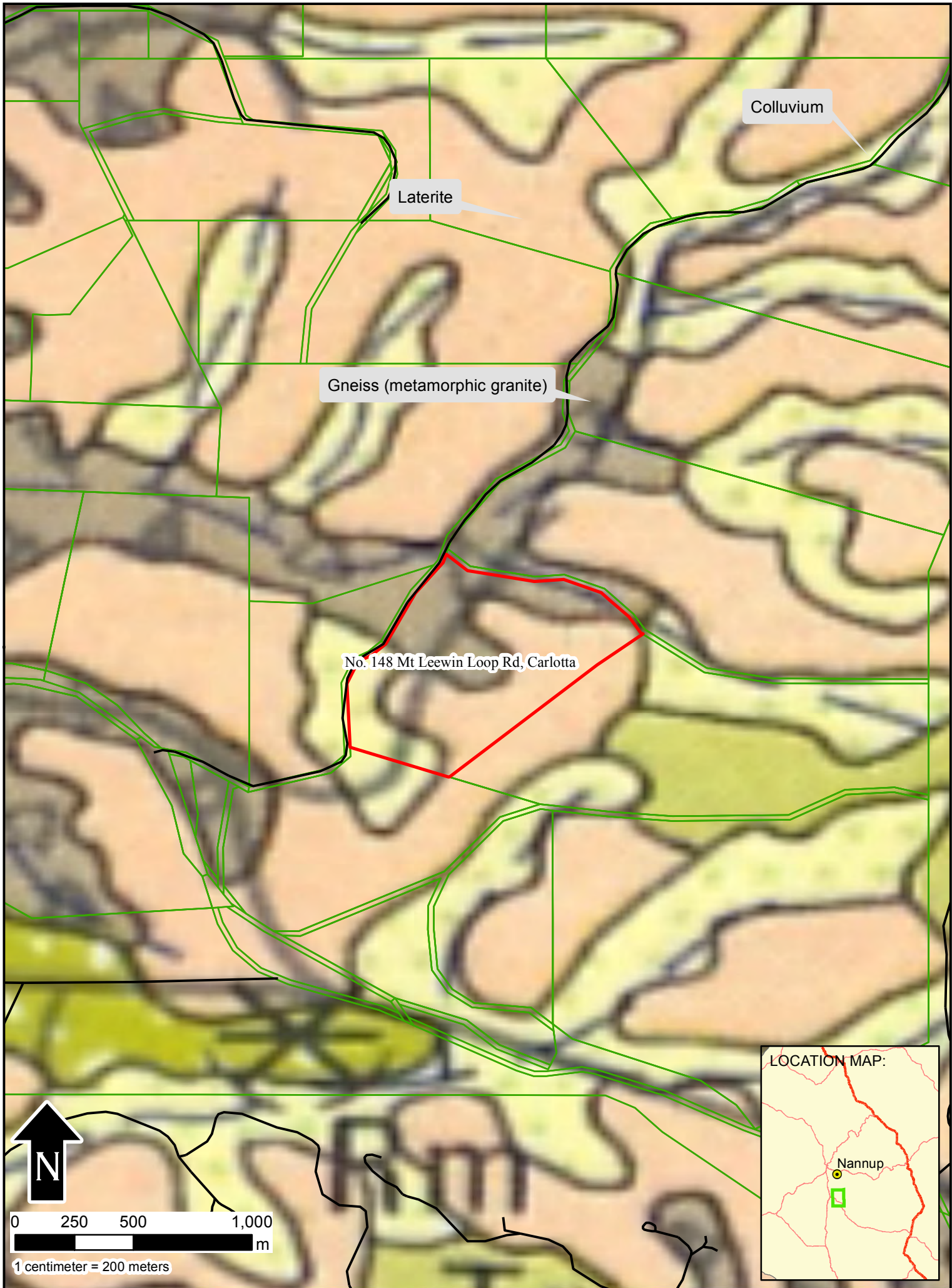
If any weeds of significance are observed within the area of current or proposed operations, or, that if the potential for weed spread exists through the general operational activities then appropriate weed management activities (to manage and control) will be undertaken. The Proponent undertakes periodic weed spraying as required as a part of the general farm management.

3.5 Geology and Soils

Much of the area is on the Blackwood Plateau, neighbouring the Darling Plateau, the south-western part of the Great Plateau (Churchward, 1992). The local geology is comprised of three main components: Gneiss, overlain by Laterite, overlain by Colluvium (See Figure 3).

Gneiss is a common and widely distributed type of metamorphic rock, formed under high pressure and high temperatures.

The laterite (which comprises the main area for excavation – pisolitic gravel) is a rock type rich in iron and aluminium and the local laterite is red coloured, indicating it is high in iron oxide content. The colluvium is primarily loose, unconsolidated sediment that has been deposited at the base of hillslopes via a range of processes, including via rain (Dept. Mines and Petroleum, Map Sheet si5010, Pemberton). Previous Quality of Materials Reports describe the material Type as Brown Gravel (ranging from Brown Clayey Silty Gravel to Brown Clay Gravel).



Colluvium

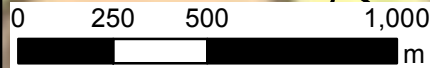
Laterite

Gneiss (metamorphic granite)

No. 148 Mt Leewin Loop Rd, Carlotta

LOCATION MAP:

Nannup



1 centimeter = 200 meters

Base map:
Dept of Mines and
Petroleum WA.
250k Published Geology,
Sheet si5010.



No. 148 Mt Leewin Loop Road, Carlotta, WA
Published Geology

Figure: 1
Project:

Drawn: CNH
Date: 2019-10-30

Coordinate System:
GDA 1994

A4

3.6 Topography and Surface Water

The proposed extraction site is located in an area that ranges from 218m above sea level to approximately 290m (see Figure 4) which is considered to be hilly terrain. Storm water from the quarry drains to the sediment traps located to the west of the quarry (refer Figure 5). Any overflow passes across established paddocks, with drainage in a westerly direction.

Storm water collected in the sediment traps drains naturally into the soil or evaporates. No pumping is required. Any sediment trapped remains in the traps, which will be infilled at rehabilitation. Given the topography of the area and the nature of the ground material, it is unlikely that there will be any impacts from expression of surface water within the current or proposed extraction area. Although no stormwater management issues are anticipated, as an additional precautionary management feature, two overflow/contour drains from the northernmost sediment trap were constructed which will allow any excess water to flow from the excavation pit area, down-slope across a paddock and into one of the farm dams.



Base map:
Worldwide Imagery -
Sourced from
ESRI.



No. 148 Mt Leewin Loop Road, Carlotta, WA
Topography









Figure: 1
Project:

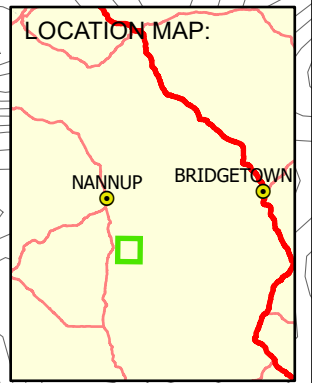
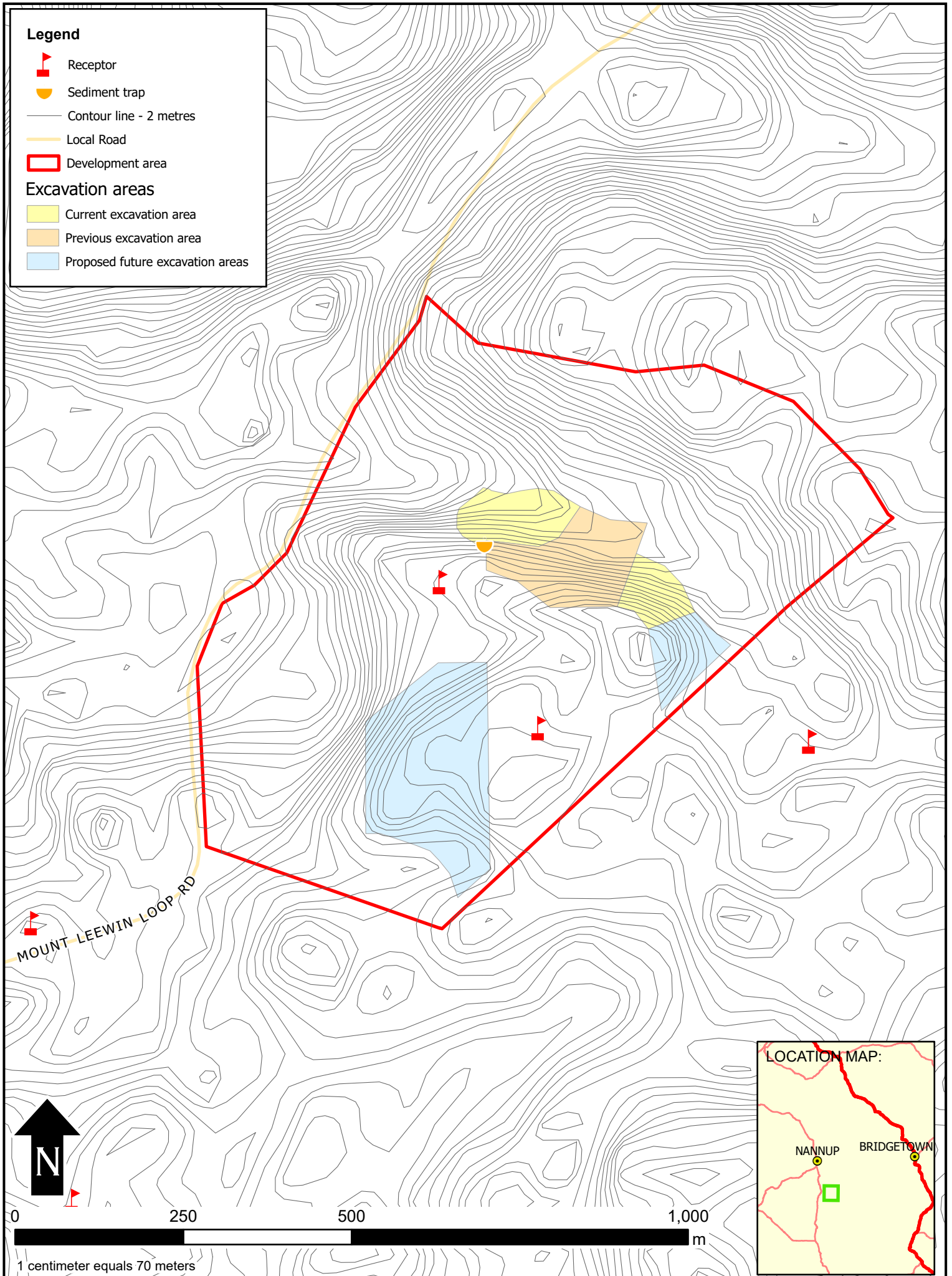
Drawn: CNH
Date: 2019-10-30

Coordinate System:
GDA 1994

A4

Legend

-  Receptor
-  Sediment trap
-  Contour line - 2 metres
-  Local Road
-  Development area
- Excavation areas**
 -  Current excavation area
 -  Previous excavation area
 -  Proposed future excavation areas



Sources: Landgate SLIP, MRWA, Esri and the GIS User Community



No. 148 Mt Leewin Loop Road CARLOTTA WA
Development Plan - 2 metre contours

Figure: 5
Project:

Drawn: CNH
Date: 23/03/2026

Coordinate System:
GDA2020 MGA Zone 50

3.7 Hydrogeology

The Leederville aquifer is present at the surface (this is a relatively shallow aquifer), with the Parmelia formation (a confining layer) underlain by the Yarragadee aquifer (a deep confined aquifer). Recharge of the Yarragadee in this area is via both downward infiltration from the Leederville and direct infiltration where the land outcrops (Department of Water, 2012).

As drinking water from the local production bore is drawn from this deep confined aquifer, the potential for any contamination from surrounding land uses is considered negligible. Any potential contamination from the proposed extraction activities is also considered negligible. No local groundwater monitoring bores are near the proposed site. From the agric.wa.gov.au resource assessment interactive map, the salinity risk in this area is classified as Very Low and that the groundwater trend time to equilibrium is short term.

No groundwater exposure or contamination from the proposed extractive activities is anticipated.

3.8 Heritage

A search of the Aboriginal Heritage Enquiry system (October 2019) indicated that the enquiry is on land within or adjacent to the South West Boojarah #2 People Indigenous Land Use Agreement (ILUA). However, no Registered Sites or other heritage matters are within the proposed application area. An updated search was undertaken in March 2026 which showed there were no changes from the previous search.

A search of the InHerit Database was undertaken again in March 2026 which showed there were no sites of other heritage significance in the property area.

3.9 Dust

Dust may be generated from a range of activities, including:

- Topsoil removal;
- Gravel excavation;
- Screening of gravel;
- Loading of haulage trucks; and
- Machinery use/vehicles on the unsealed surfaces/access tracks.

To mitigate any potential impacts on the nearest neighbour (as mentioned in Section 2.7), Worthy Contracting proposes to create a sound/visual barrier (2.5-3m high and 100m in length) if requested by the relevant neighbour to reduce any potential sound disturbance or dust emissions along the eastern boundary of the property where the pit is proposed to be extended. To reduce dust during normal operations, water is sprayed from the water cart as required. To reduce potential dust and therefore also topsoil loss, no extractive operations occur on high wind days.

Nannup and the subregion of Carlotta experience a wide and variable range of wind directions throughout the year. Recent data from the Bureau of Meteorology for Carlotta indicates typical South West winds ranging from 15-25km/h, with occasional stronger gusts during changing conditions. Average winds range between South East and South West. If these are the prevailing

major winds in the region, dust generated under these conditions is not anticipated to have any significant impact on any of the nearest receptors/residences in the area. Conditions for maximum dust levels occur in the summer months when the ground conditions are dry.

3.10 Visual Amenity

Being located on a rural property, the extractive area is not considered to be in a visually sensitive area. Once rehabilitation has taken place with the land being returned to pasture there will be little evidence that extractive activities have occurred.

3.11 Noise

The majority of noise generating activities on site will be from:

- Excavation of material;
- Crushing/screening of material;
- Loading of haulage trucks; and
- Movement of haulage trucks.

The site is located on a large rural property and is surrounded by other rural properties. Due to the separation distances provided by the EPA guidelines, most structures and residences are beyond the 500m mark (refer to Section 2.7) with the exception of the nearest neighbour at 417m from the proposed new extraction area. The construction of the proposed sound/dust barrier as discussed is considered an appropriate noise/dust management buffer. No noise management issues are anticipated for the proposed operations, however industry standards for managing noise levels will continue to be implemented. Such measures include:

- Topsoil being pushed up in bunds along pit edges to reduce noise;
- All plant/machinery to be kept well maintained; and
- Complaints register to be maintained. Details for lodging complaints will be advertised on the company website.

3.12 Dieback

Dieback (*Phytophthora cinnamomi* and other species) occurs throughout the South West. No presence of dieback has been observed in the area where material is extracted or transported through on site. The natural spread of the fungus through the soil or infected root systems is slow (1-10m/year) but is significantly faster (many km/year) if being transported via free-flowing water or via vehicles, machinery and footwear (Department of Mines and Petroleum. 2006).

Worthy Contracting operates from an established gravel pit on a pastured lot, and does not undertake any extraction from areas of native vegetation. The proposed expansion of the pit does not require any removal/clearing of native vegetation. Heavy machinery does not operate off-site or on private land during wet conditions where there could be infected vegetation.

If activities/equipment use under such conditions was necessary, suitable dieback hygiene strategies will be implemented, such as appropriate clean down of all vehicles/equipment on leaving an infected area.

4. Operational Activities

4.1 Proposed Extraction

Worthy Contracting proposes to continue to extract gravel from the excavation areas in a staged manner (see Figure 6) as approved in the previous approval granted by the Shire. This extraction is proposed to occur throughout the life of the Development Application Approval, ie another 15 years. Excavation activities at this scale are considered to be low scale.

Deep excavation is not required due to the gravel being in the upper levels of the soil profile. Each active area will be stripped of topsoil and this will be stockpiled for use as a noise attenuating structure, then used for rehabilitation. These soil stockpiles will be no greater than 2m in height. The soil will be excavated with a front-end loader. Gravel is extracted via ripping of the surface and excavated with earthmoving plant (ie dozer, excavator) and transported to the crusher/screener via loader/dump truck. Gravel is then stockpiled next to the crushing and screening plant for processing. Haulage trucks are then used to transport the gravel off-site.

Legend

Local Road

Development area

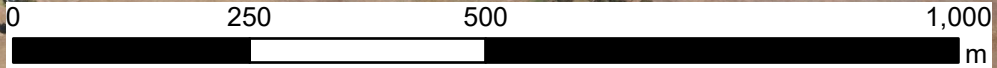
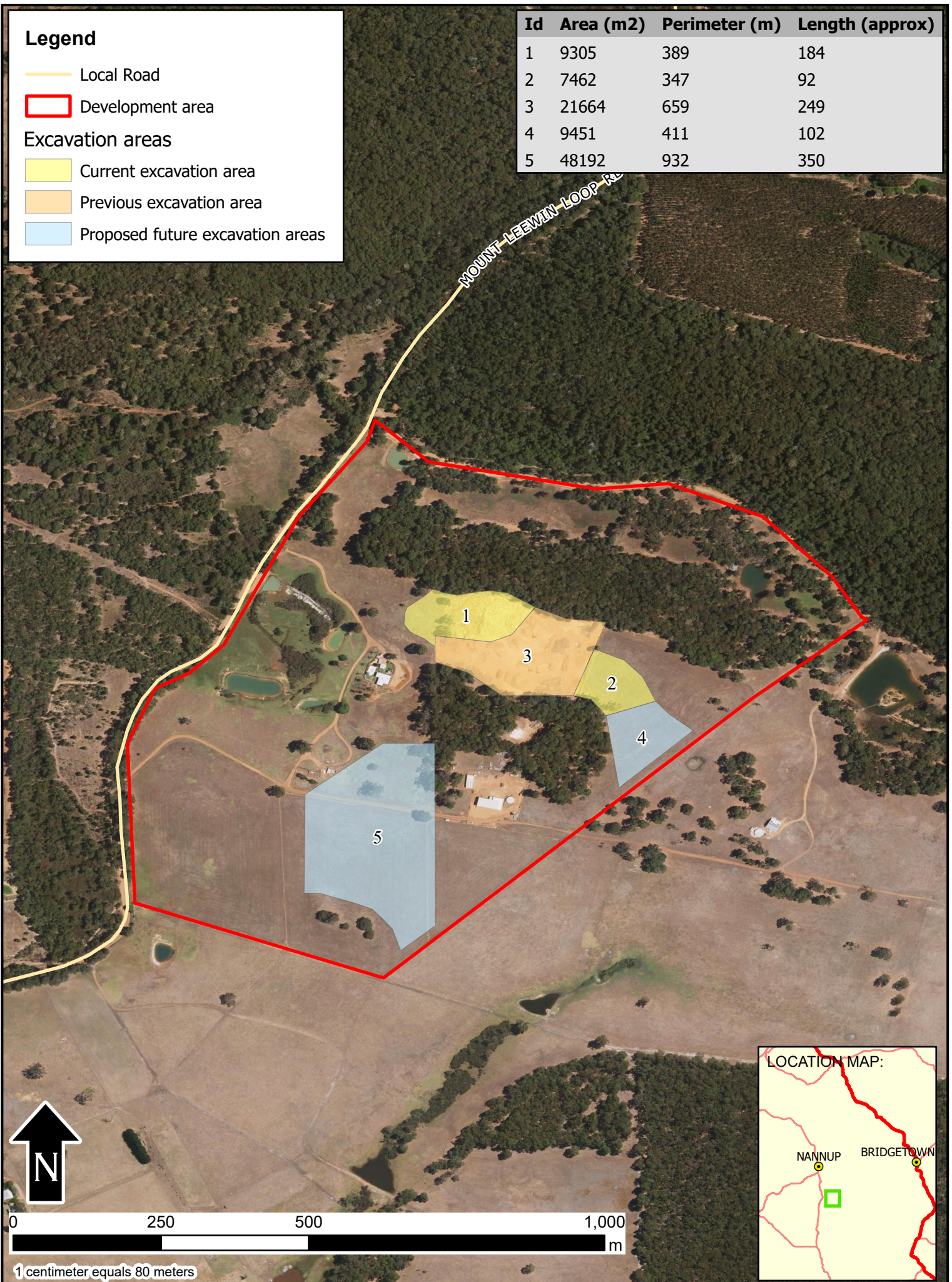
Excavation areas

Current excavation area

Previous excavation area

Proposed future excavation areas

Id	Area (m2)	Perimeter (m)	Length (approx)
1	9305	389	184
2	7462	347	92
3	21664	659	249
4	9451	411	102
5	48192	932	350



1 centimeter equals 80 meters

Sources: Landgate SLIP, MRWA, Esri and the GIS User Community



No. 148 Mt Leewin Loop Road CARLOTTA WA
Development Plan - Excavation Areas

Figure: 6
Project:

Drawn: CNH
Date: 23/03/2026

Coordinate System:
GDA2020 MGA Zone 50

A4

4.1.1 Depths and Extent of Excavation

The depths of extraction will vary across the proposed pit location, dependent on the profile of the lateritic layer. To date, excavation of the profile has not exceeded a maximum of 3m depth. The average depth of excavation is 1.3-1.5m and this is expected to continue throughout the lifespan of the quarry. If the profile in the proposed extended pit areas deteriorates then excavation will cease.

4.2 Operating Times

The quarry will operate year round Monday to Friday from 6am – 6pm (this represents staff on-site at 6am but no extractive activities until 6:30am). During the summer months (December to February) the quarry will also operate on Saturday, 7am – 2pm. These hours are dependent on product demand, so operating times may be reduced, and so can be described as having low and peak periods of operation. Peak periods are generally during the summer months. Market demand for gravel will also have an influence on the operation of the pit.

There will be no extractive/screening activities or haulage on Sundays or public holidays. The only activities that may be undertaken outside of the nominated hours will be for essential maintenance only.

4.3 Public Access

The site is located on a rural property and is surrounded by rural land. Warning signs (truck-entering) are located well in advance of entrance gates as required by the Shire and Main Roads Authority (Figure 7). Public access is restricted. Direct access to the property outside of these hours is controlled by locked steel double gates and no access to the public is authorised. Previously there had been signage on the gates to this effect, with instructions on how to contact the site manager. However, this has been temporarily removed due to the increased risk of theft (particularly fuel) from the property.



Figure 7

4.4 Surrounding Road Network and Transport Movements

The quarry will be accessed directly off Mount Leewin Loop Road, which is an unsealed gravel road, with adequate drainage which then joins Graphite Road (sealed bitumen). There is a school bus stop at the intersection of Mount Leewin Loop Road and Graphite Road. There have been no recorded incidences or complaints about truck movements or operations since extractive operations commenced. Staff are also instructed to avoid any truck movements during the periods the school bus is scheduled to be at the bus stop.

Vehicles have two direct entry locations, the main entry being on Number 101 Mount Leewin Loop Road and the other (emergency use only) on Number 148. Both entries are well compacted gravel roads. Both access routes lead to the quarry, with one going past the workshop/shed and the other past the main residence. The internal road network provides all weather access to all operational vehicles. Extracted gravel will be removed and transported via two main vehicle types, a 12T and 24T Semi. During peak operation times, it is anticipated that approximately 8 truck movements of both types would occur on any operational day (16 movements maximum in total). This is dependent on demand.

Worthy Contacting is accredited with Mainroads Western Australia under WA Heavy Vehicle Accreditation (WAHVA) and recertification is renewed annually. Graphite Road forms a vital link east-west between Nannup to Manjimup and links the Vasse Highway with the South West Highway and is classified as a Regional Distributor. The existing road standard is sealed and generally 6m wide. The majority of this road has been upgraded to a type 4 standard under the Roads 2020 program (Mainroads Western Australia, 2013).

Traffic statistics along Graphite Road are not available, but a search of the Mainroads WA Traffic Map database shows along the Vasse Highway, north of Graphite Road for the 2025-2026 average vehicle movements, Monday to Sunday total as 825, with 83.5% cars and 16.5% trucks. This is only a slight increase from the previous search (2018/2019 average vehicle movements (Monday to Sunday) total as 600, with 86% cars and 14% trucks).

From Manjimup (the next nearest set of data) there are no monitoring points along Graphite Road, so statistics for vehicle movements are not available. From the information available, the potential associated with collision of general vehicles with operational vehicles continues to be considered low.

4.5 Maintenance of Vehicles

Servicing requirements, including pre-start checks and refuelling procedures are carried out at the workshop prior to work commencement each morning. No fuel or hydrocarbons are stored within the excavation area, only at the workshop. However, if an operating vehicle within the pit runs out of fuel, fuel will be transported to the vehicle and appropriate measures will be undertaken to ensure no potential contamination of the soil can occur. If the vehicle breaks down within the pit area necessary precautions will be carried out using industry best practice techniques to ensure hydrocarbons do not enter the environment. Such measures (for refuelling or vehicle breakdown) will include hydrocarbon management kits such as drip trays, plastic liners/sheets. In the event of a spill, any contaminated soil will be contained and removed to an appropriate disposal site and any old oils will be collected and recycled offsite at the nearest licensed facility, in this case the Nannup Waste Management Facility. Where major servicing is required, the machine in question will be removed from the site.

4.6 Benefits of the Proposal

The extraction of material from this site is necessary for providing material to the Shire of Nannup and its residents for ongoing building, construction and road maintenance. This project will continue to employ local people and it is envisaged with the approval of this proposal that additional employment within the general community will be generated.

5. Rehabilitation

5.1 Proposed Rehabilitation

Rehabilitation of the completed areas will be progressive, with the areas returned to pasture. Some rehabilitation has already occurred, with trees planted in 2020 on the eastern side of the main pit. Further rehabilitation will be undertaken this winter (2026) and the remainder will occur at close out of the pit areas.

Due to the size of the extractive area and that the intent is to return the area to pasture, a Revegetation Plan is not considered necessary at this stage. A general methodology however is to undertake a staged approach, with rehabilitation beginning once an area has been extracted. As a general rule, the following steps will be implemented:

- Stockpiled topsoil will be retained during extraction and spread back over the completed areas;
- The pit floor will be ripped along the contour;
- Pasture seed will be spread; and
- Ongoing monitoring of the pasture will be undertaken.

The restoration/rehabilitation goal for this site is to return the area post-extraction to viable pasture for grazing and to ensure the resulting landform is stable and erosion resistant. It will blend with the surrounding landscape.

5.2 Completion Criteria

Completion criteria are necessary to ensure that the objectives of rehabilitation have been met. Table 1 below provides a summary of the criteria, objectives and targets.

Criteria	Target	Actions
1. Off-site impacts	That off-site impacts (ie dust) that could affect nearby residents do not occur	<ul style="list-style-type: none"> • Successful re-establishment of pasture
2. Landform stability	<ol style="list-style-type: none"> 1. That the final landform is stable 2. No erosion occurs 	<ul style="list-style-type: none"> • Identification of potential erosion areas are identified and managed during rehabilitation
3. Vegetation	That the area will be returned to pasture	<ul style="list-style-type: none"> • Successful re-establishment of pasture
4. Weeds	That declared weeds will not be present	<ul style="list-style-type: none"> • Declared weeds if present will be removed/managed
5. Visual amenity	The rehabilitated area will be returned to pasture and blend with the surrounding environment	<ul style="list-style-type: none"> • Successful re-establishment of pasture
6. Fauna	Fauna will return to the site area	<ul style="list-style-type: none"> • Successful re-establishment of pasture
7. Hydrology	<ol style="list-style-type: none"> 1. That the final landform will not be affected by site hydrology 2. Stormwater will not negatively impact the site 	<ul style="list-style-type: none"> • Stormwater will be managed during rehabilitation

Table 1: Completion Criteria

6. References

Churchward, H.M. 1992. Soils and Landforms of the Manjimup Area, Western Australia. Land Resource Series No. 10.

Department Mines and Petroleum, Map Sheet si5010, Pemberton. Local Geology Descriptions.

Department Mines and Petroleum. 2006. Management of Dieback Disease in Mineral Exploration.

Department of Water. 2012. Water Resource Protection Series. Nannup Water Reserve, Drinking water source protection plan. Report WRP 131. April 2012.

LMW Hegney. 2012. Valuation Report. Lot 101 Mount Leewin Loop Road, Carlotta, Western Australia 6275.

Mainroads Western Australia. 2013. Roads 2030. Regional Strategies for Significant Local Government Roads 2013.

APPENDIX A

Certificate of Title



REGISTER NUMBER 101/DP65066	
DUPLICATE EDITION 1	DATE DUPLICATE ISSUED 23/11/2009

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2732** FOLIO **401**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 101 ON DEPOSITED PLAN 65066

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

BENJAMIN LAURENCE WORTHINGTON OF POST OFFICE BOX 133, NANNUP
(T L178368) REGISTERED 18/12/2009

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

- *G289834 MEMORIAL. SOIL AND LAND CONSERVATION ACT 1945. AS TO PORTION ONLY. REGISTERED 26/9/1996.
- *L018381 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 24/7/2009.
- EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR ELECTRICITY PURPOSES TO ELECTRICITY NETWORKS CORPORATION - SEE DEPOSITED PLAN 65066.
- *L178369 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 18/12/2009.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP65066
PREVIOUS TITLE: 1216-901
PROPERTY STREET ADDRESS: 148 MOUNT LEEWIN LOOP RD, CARLOTTA.
LOCAL GOVERNMENT AUTHORITY: SHIRE OF NANNUP

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING L178369

APPENDIX B

Dust Management Plan

Dust Management Plan

**No. 148 Mount Leewin Loop Road
Carlotta, Shire of Nannup**



Prepared for
Worthy Contracting

By



rachael@abrus.com.au
MOBILE: 0429137757

Date: November 2019
Report Version: 1

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1.1 Dust Generating Activities.....	1
2.1 Land Use and Location.....	1
2.2 Geology and Soils.....	3
2.3 Receiving Environment.....	3
2.4 Prevailing Winds.....	5
3 Operations and Potential Impacts.....	8
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Dust Management Plan

**No. 148 Mount Leewin Loop Road
Carlotta, Shire of Nannup**

1 Introduction

Management of dust is a primary issue for all extractive industry operators. Although it is accepted that some dust generation is unavoidable during extractive activities, it cannot adversely affect health, have a negative impact on amenity of local residents or on the environment. This Dust Management Plan (DMP) has been prepared in accordance with guidelines as provided by the Department of Environment and Conservation. This Plan should be read in conjunction with the Development Application “Extractive Industry Application and Management Plans, No. 148 Mount Leewin Loop Road, Carlotta, Shire of Nannup” prepared by Abrus Consulting Pty Ltd.

The objectives of this DMP include:

- To describe the nature of the proposed extraction activities;
- To identify potential dust sources from operations;
- To identify any sensitive receptors and their proximity to operational areas; and
- To identify and describe measures to limit dust generation and its impacts on receptors.

1.1 Dust Generating Activities

The following operations have the potential to generate dust:

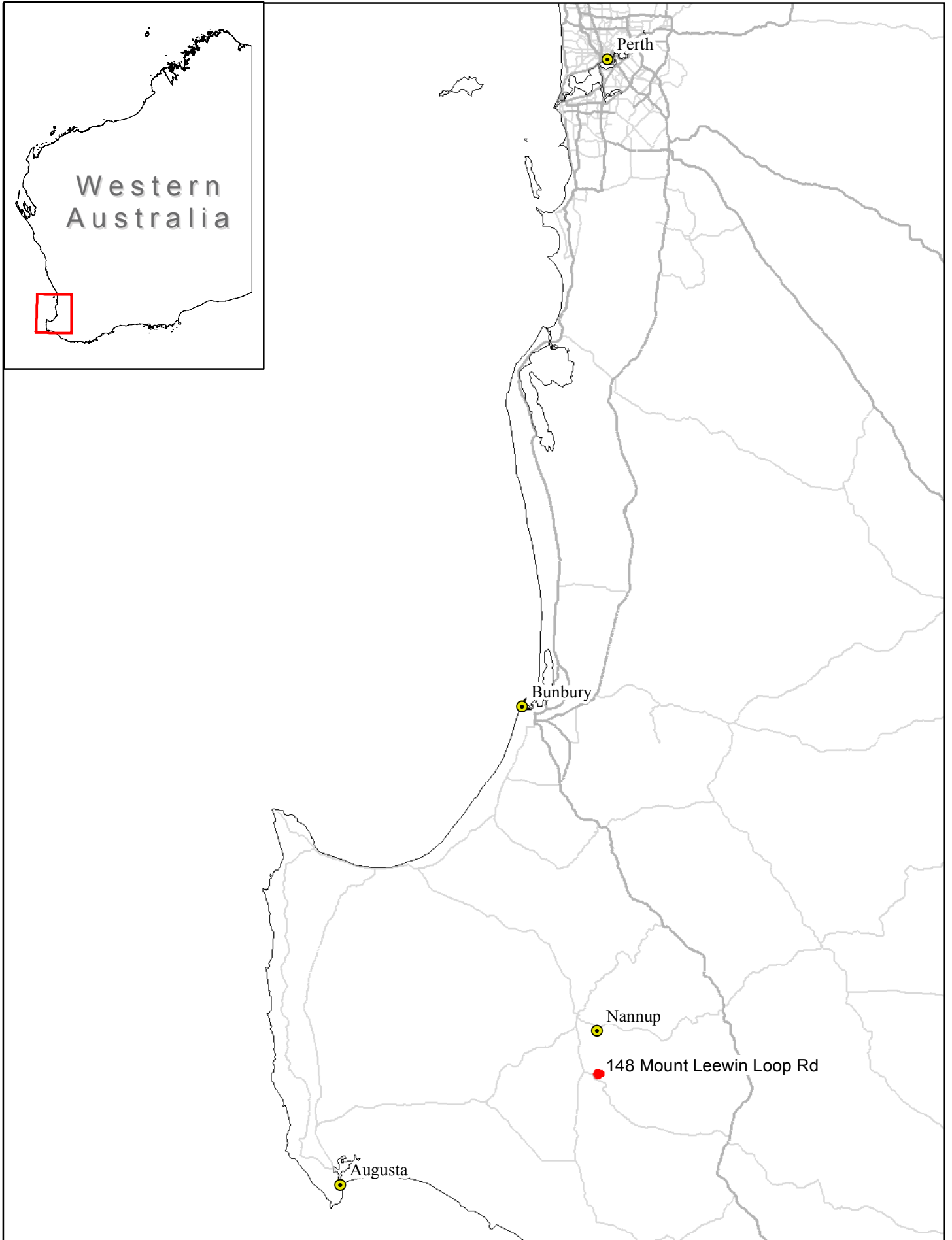
- Removal of topsoil
- Excavation of gravel;
- Crushing and screening of gravel (materials processing);
- Material movement (loading of gravel) into haul trucks; and
- Vehicle movement onsite (unsealed ground).

2.1 Land Use and Location

The proposed gravel quarry is located approximately 18 km south of Nannup township, on Lot 101, Number 148 Mount Leewin Loop Road, Carlotta (Plan 65066). The property is owned by Benjamin Worthington.

The proposed gravel pit area is surrounded by agricultural land, forestry plantations, and lifestyle. In a wider context this area is within a few kilometres of State Forest (South East Nannup State Forest to the east and north, and Barlee Brook and South East Nannup State Forests to the south). This property is comprised of 55.251 hectares (ha) and is primarily used for agricultural purposes (ie grazing) and a gravel extractive industry. It is considered to be approximately 73% cleared for well established pasture and the gravel pit (total of 40.251 ha) and with approximately 15 ha of remnant native vegetation.

The property is situated on the eastern side of Mount Leewin Loop Road and is 1.4km from the junction with Graphite Road (see Figure 1).



0 10 20
km

Coordinate System:
GDA 94 MGA Zone 50



No. 148 Mount Leewin Loop Road
Development Application
Figure 1 Location Plan

DRAWN	CNH	DATE	6/11/2019
CHECKED	RW	DATE	6/11/2019
SCALE	1:1,158,771		A4
PROJECT No.	FIGURE No. 1		

2.2 Geology and Soils

Much of the area is on the Blackwood Plateau, neighbouring the Darling Plateau, the south-western part of the Great Plateau (Churchward, 1992). The local geology is comprised of three main components: Gneiss, overlain by Laterite, overlain by Colluvium.

The laterite (which comprises the main area for excavation – pisolithic gravel) is a rock type rich in iron and aluminium and the local laterite is red coloured, indicating it is high in iron oxide content. The colluvium is primarily loose, unconsolidated sediment that has been deposited at the base of hillslopes via a range of processes, including via rain (Dept. Mines and Petroleum, Map Sheet si5010, Pemberton).

2.3 Receiving Environment







The EPA Guideline Separation Distances between Industrial and Sensitive Land Uses (No. 3, June 2005) requires a minimum separation of 1000m between sensitive land use and extraction/screening works. Figure 2 shows the nearest residential dwellings to the active pit edge. Only residences within 1000m are included.

The nearest residence (Receptor 1 in the table below) is located approximately 417m to the east of the current pit area, and approximately 198m from the edge of the new pit. Other receptors are listed in Table 1.

Receptors	Occupants Name	Distance from pit edge (M)
1	Sally Edwards	198
2	Owner/Operator	243
3	Kevin Black & Jane Pillow	745

Table 1. Receptors for Potential Dust Impacts (New Pit)

Legend

-  Receptor
-  Local roads
-  Property boundary
- Excavation plan**
-  Current excavation area
-  Previous excavation area
-  Proposed future excavation areas



Sources: Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, GeoEye, USDA FSA, USGS, AeroGRID, IGN, IGP, and the GIS User Community



No. 148 Mt Leewin Loop Road, Carlotta, WA
Development Plan - Local Receptors

Figure: 2	Drawn: CNH
Project:	Date: 2019-11-26
Coordinate System: GDA 1994	A4

2.4 Prevailing Winds

Nannup and the subregion of Carlotta experience a wide and variable range of wind directions throughout the year. Given a five year average from the Bureau of Meteorology, the highest percentages range from 13.16% of the time winds come from a southerly direction, 8.14% are north north westerly. If these are the prevailing major winds in the region, dust generated under these conditions is not anticipated to have any significant impact on any of the nearest receptors/residences in the area. Conditions for maximum dust levels occur in the summer months when the ground conditions are dry. The nearest data monitoring point for the Nannup region is at Cape Leeuwin. Historic wind rose data are shown below, which illustrate the variability in wind directions and strength.

Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to 31 Jul 2019)

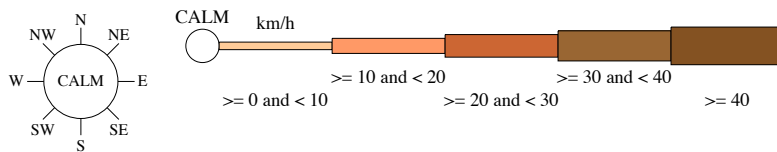
Custom times selected, refer to attached note for details

CAPE LEEUWIN

Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

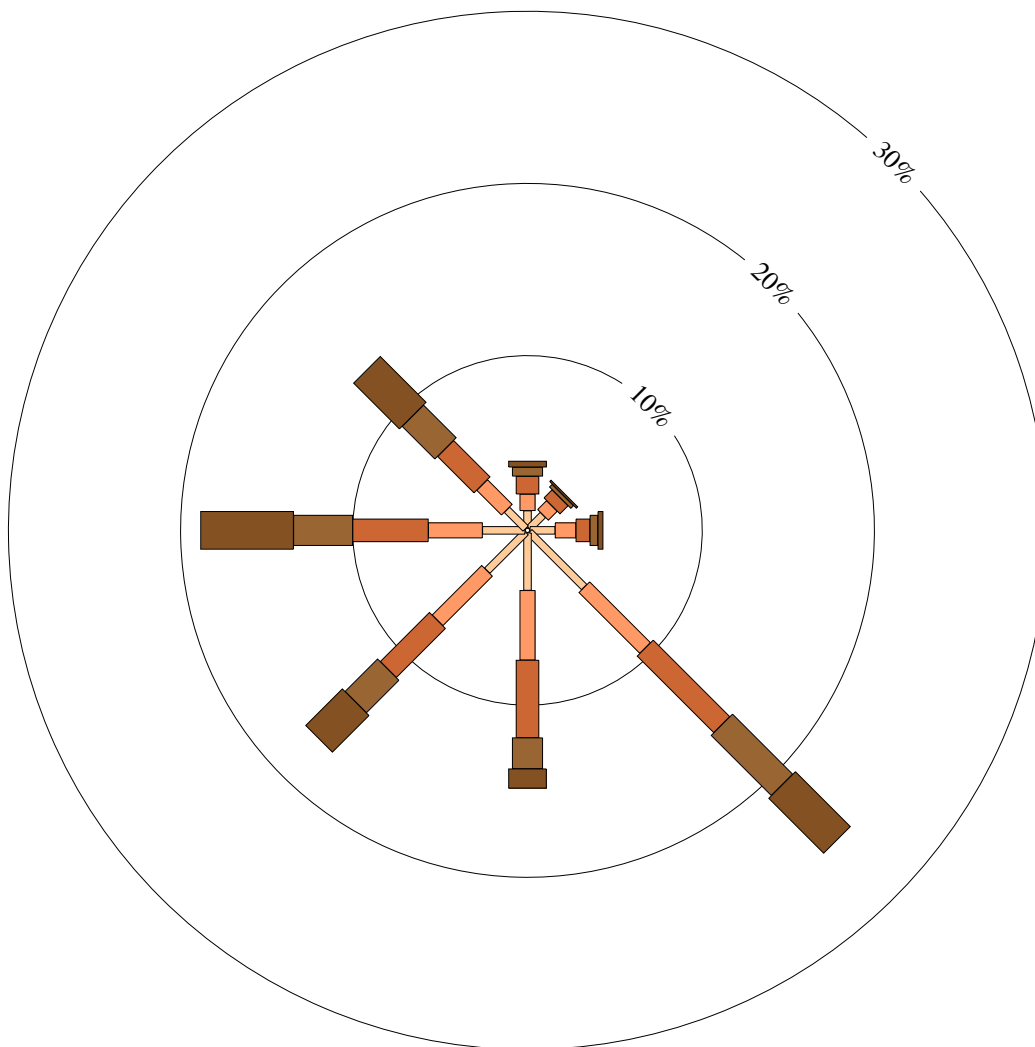
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



3 pm
40648 Total Observations

Calm 1%



Rose of Wind direction versus Wind speed in km/h (01 Jan 1907 to 31 Jul 2019)

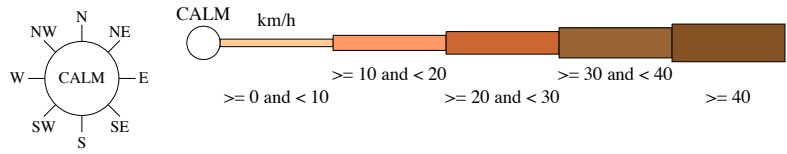
Custom times selected, refer to attached note for details

CAPE LEEUWIN

Site No: 009518 • Opened Jan 1897 • Still Open • Latitude: -34.3728° • Longitude: 115.1358° • Elevation 13m

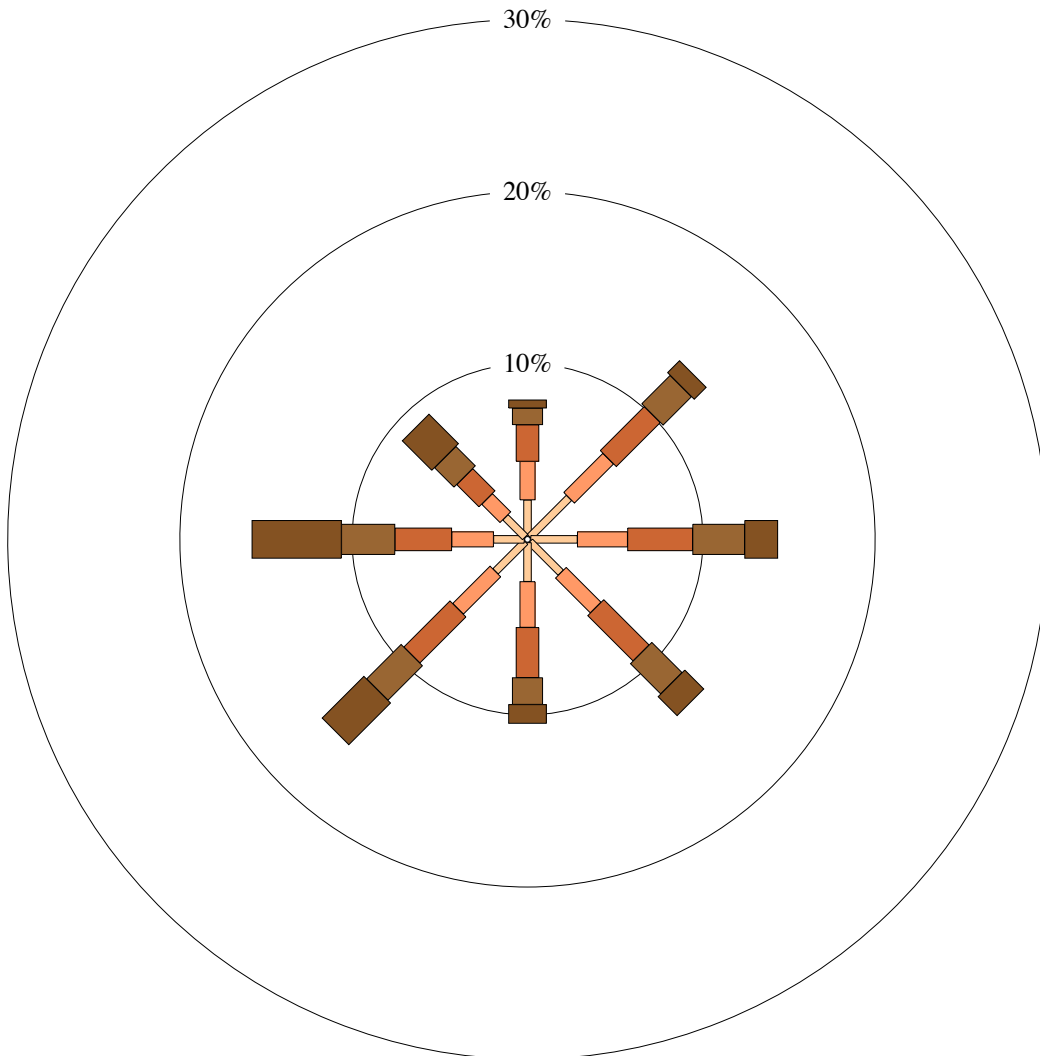
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



9 am
40676 Total Observations

Calm 1%



3 Operations and Potential Impacts

The current excavation operations have received no complaints or registered concerns from nearby residents, and this operation has been active for a period of fifteen years.

Nuisance dust levels are a potential impact from operational activities. However, it must be noted that due to the experience of the operator, if wind conditions are unfavourable then dust generating activities will be avoided on these days. Visual monitoring of dust emissions is standard practice onsite and is considered the first line of action in relation to dust management. Weather condition monitoring also occurs on a daily basis. To improve reduction of dust emissions, water spraying is implemented as required.

3.1 Soil Removal

The proponent commits to:

- Develop the quarry in a staged process so that potential impacts from soil removal are limited to the various stages of the quarry extraction;
- Remove topsoil in the wetter months or when wind conditions are favourable for minimal dust generation;
- Ensure that dust reduction (spray trucks) are utilised when required;
- Monitor the site by visual means during operations and stop work if wind conditions become unfavourable; and
- Provide a phone/email link on property signage and on the company website for nearby residents/complaints.

3.2 Quarry Operations

Dust management actions for quarrying operations (current and proposed) include:

- Watering of haul roads/pit floor/stockpiles if required (via visual observations);
- Watering and/or covering of loads if required; and
- Implementing speed restrictions within the quarry area.

4 Actions

Management actions for identified risks are provided in Table 2 below.

Monitoring	Risk	Action
Visual dust	Nuisance dust emissions observed/weather prediction	Staff to report observation to Manager. Manager will advise appropriate action.
Complaints register	Complaint	Manager to assess dust/wind data and notify complainant of outcome of conditions and actions taken (if any)

Table 2. Management Actions

5 Document Review

Worthy Contracting will review all site management documentation on an annual basis. Any alterations/improvements to reflect the operational activities at the site will be updated in future documents.

6. References

Churchward, H.M. 1992. Soils and Landforms of the Manjimup Area, Western Australia. Land Resource Series No. 10.

Department Mines and Petroleum, Map Sheet si5010, Pemberton. Local Geology Descriptions.

APPENDIX C

Drainage Management Plan

Drainage Management Plan

**No. 148 Mount Leewin Loop Road
Carlotta, Shire of Nannup**



Prepared for
Worthy Contracting

By



rachael@abrus.com.au
MOBILE: 0429137757

Date: November 2019
Report Version: 1

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2.2 Geology and Soils.....	3
2.3 Receiving Environment.....	3
3 Operations and Potential Impacts.....	6
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Drainage Management Plan

No. 148 Mount Leewin Loop Road Carlotta, Shire of Nannup

1 Introduction

Drainage management is a primary issue for all extractive industry operators. Although it is accepted that some water movement is unavoidable during extractive activities, it cannot adversely affect health, have a negative impact on amenity of local residents or on the environment. This Drainage Management Plan (DMP) has been prepared in accordance with guidelines as provided by the Department of Environment and Conservation. This Plan should be read in conjunction with the Development Application “Extractive Industry Application and Management Plans, No. 148 Mount Leewin Loop Road, Carlotta, Shire of Nannup” prepared by Abrus Consulting Pty Ltd.

The objectives of this DMP include:

- To describe the nature of the proposed extraction activities;
- To identify potential storm water/drainage issues from operations;
- To identify any sensitive receptors and their proximity to operational areas; and
- To identify and describe measures to limit water movement and its impacts on receptors.

1.1 Dust Generating Activities

The following operations have the potential to generate dust:

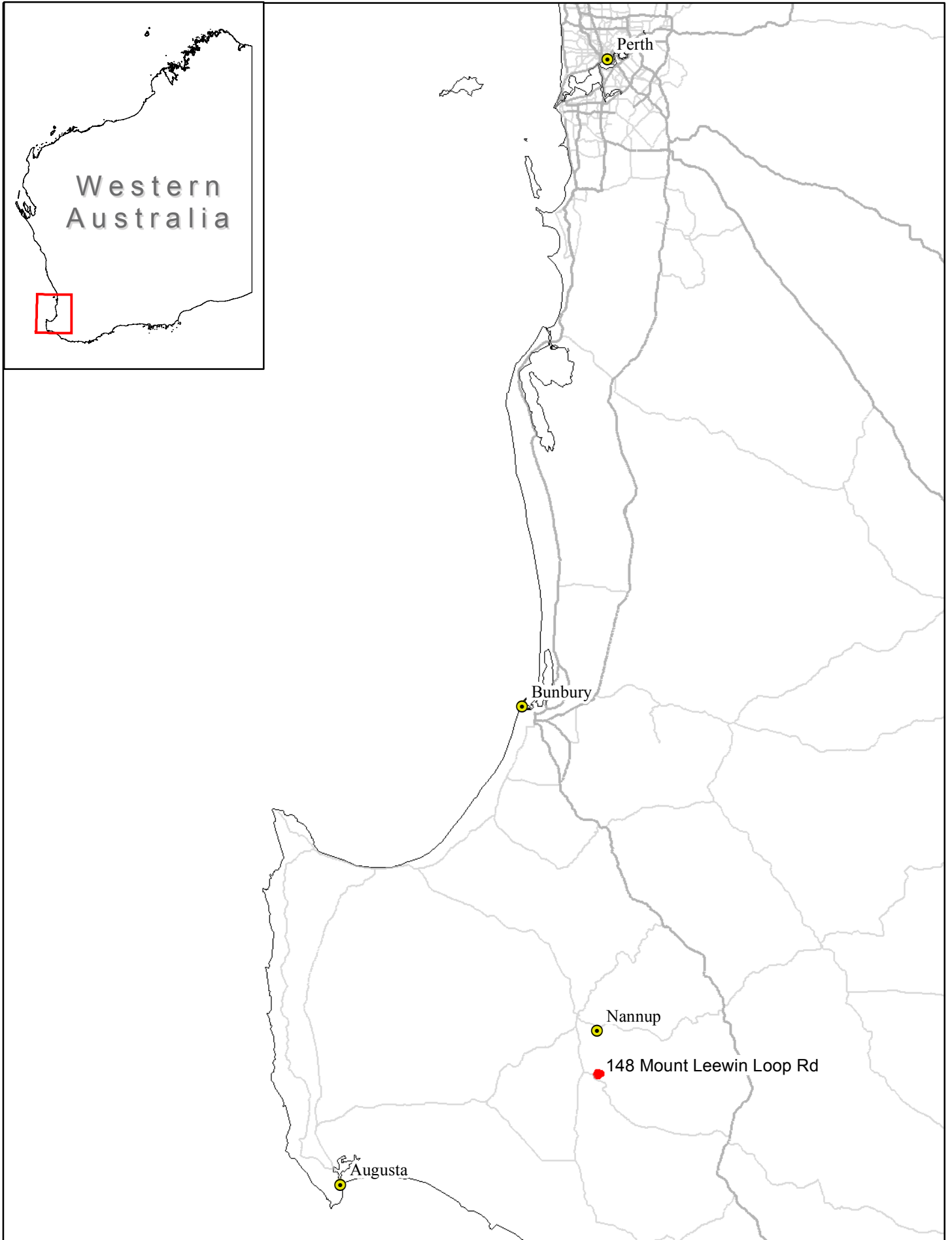
- Removal of topsoil
- Excavation of gravel;
- Crushing and screening of gravel (materials processing);
- Material movement (loading of gravel) into haul trucks; and
- Vehicle movement onsite (unsealed ground).

2.1 Land Use and Location

The proposed gravel quarry is located approximately 18 km south of Nannup township, on Lot 101, Number 148 Mount Leewin Loop Road, Carlotta (Plan 65066). The property is owned by Benjamin Worthington.

The proposed gravel pit area is surrounded by agricultural land, forestry plantations, and lifestyle. In a wider context this area is within a few kilometres of State Forest (South East Nannup State Forest to the east and north, and Barlee Brook and South East Nannup State Forests to the south). This property is comprised of 55.251 hectares (ha) and is primarily used for agricultural purposes (ie grazing) and a gravel extractive industry. It is considered to be approximately 73% cleared for well established pasture and the gravel pit (total of 40.251 ha) and with approximately 15 ha of remnant native vegetation.

The property is situated on the eastern side of Mount Leewin Loop Road and is 1.4km from the junction with Graphite Road (see Figure 1).



0 10 20
km

Coordinate System:
GDA 94 MGA Zone 50



No. 148 Mount Leewin Loop Road
Development Application
Figure 1 Location Plan

DRAWN	CNH	DATE	6/11/2019
CHECKED	RW	DATE	6/11/2019
SCALE	1:1,158,771		A4
PROJECT No.	FIGURE No. 1		

2.2 Geology and Soils

Much of the area is on the Blackwood Plateau, neighbouring the Darling Plateau, the south-western part of the Great Plateau (Churchward, 1992). The local geology is comprised of three main components: Gneiss, overlain by Laterite, overlain by Colluvium.

The laterite (which comprises the main area for excavation – pisolitic gravel) is a rock type rich in iron and aluminium and the local laterite is red coloured, indicating it is high in iron oxide content. The colluvium is primarily loose, unconsolidated sediment that has been deposited at the base of hillslopes via a range of processes, including via rain (Dept. Mines and Petroleum, Map Sheet si5010, Pemberton).

2.3 Receiving Environment

The proposed extraction site is located in an area that ranges from 218m above sea level to approximately 290m (see Figure 2) which is considered to be hilly terrain. Storm water from the quarry drains to the sediment traps located to the west of the quarry (refer Figure 3). Any overflow passes across established paddocks, with drainage in a westerly direction.

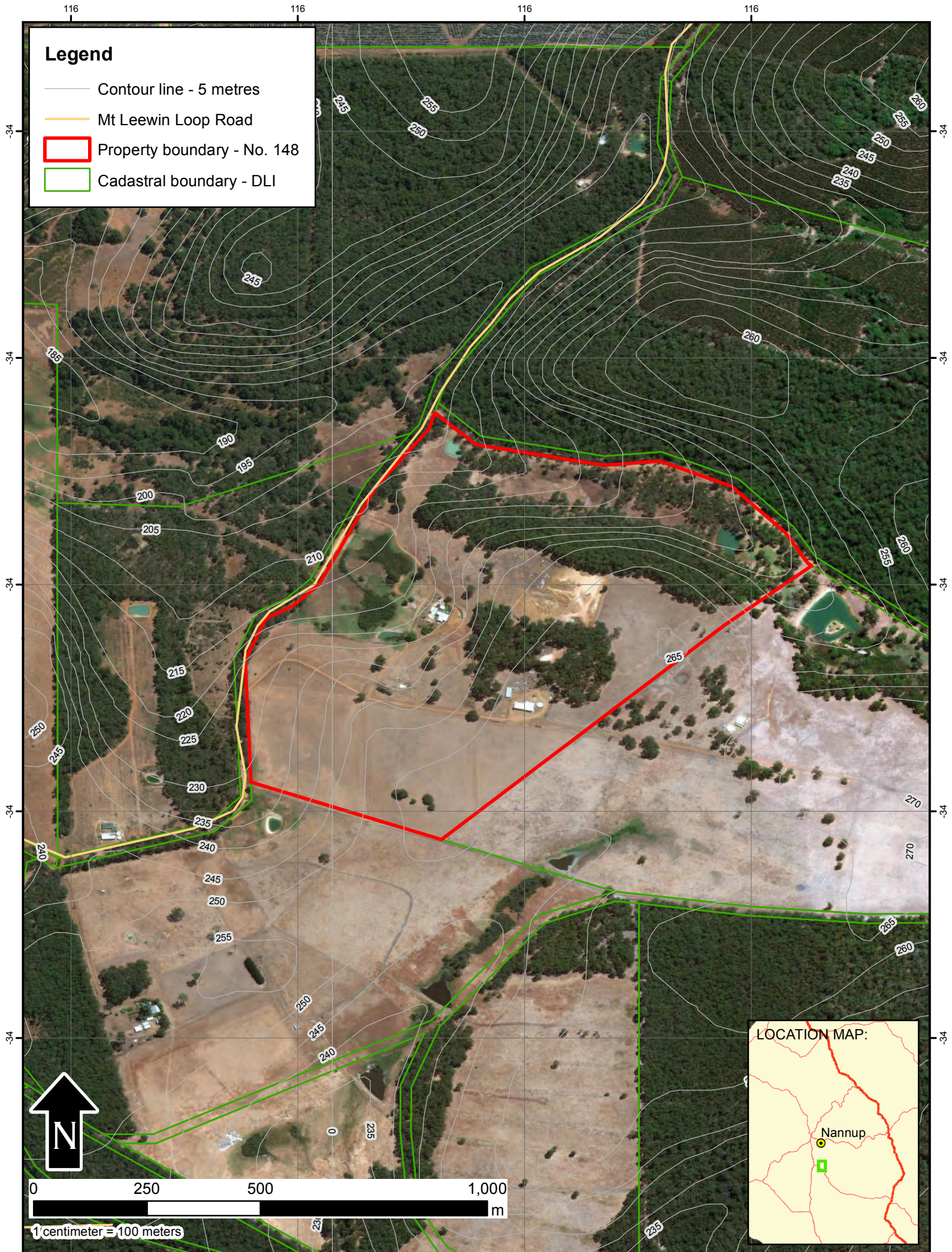
Storm water collected in the sediment traps drains naturally into the soil or evaporates. No pumping is required. Any sediment trapped remains in the traps, which will be infilled at rehabilitation.

Given the topography of the area and the nature of the ground material, it is unlikely that there will be any impacts from expression of surface water within the current or proposed extraction area.

Although no stormwater management issues are anticipated, as an additional precautionary management feature, an overflow drain from the northernmost sediment trap is proposed which will allow any excess water to flow from the excavation pit area, down-slope across a paddock and into one of the farm dams.

Legend

- Contour line - 5 metres
- Mt Leewin Loop Road
- Property boundary - No. 148
- Cadastral boundary - DLI



Base map:
Worldwide Imagery -
Sourced from
ESRI.










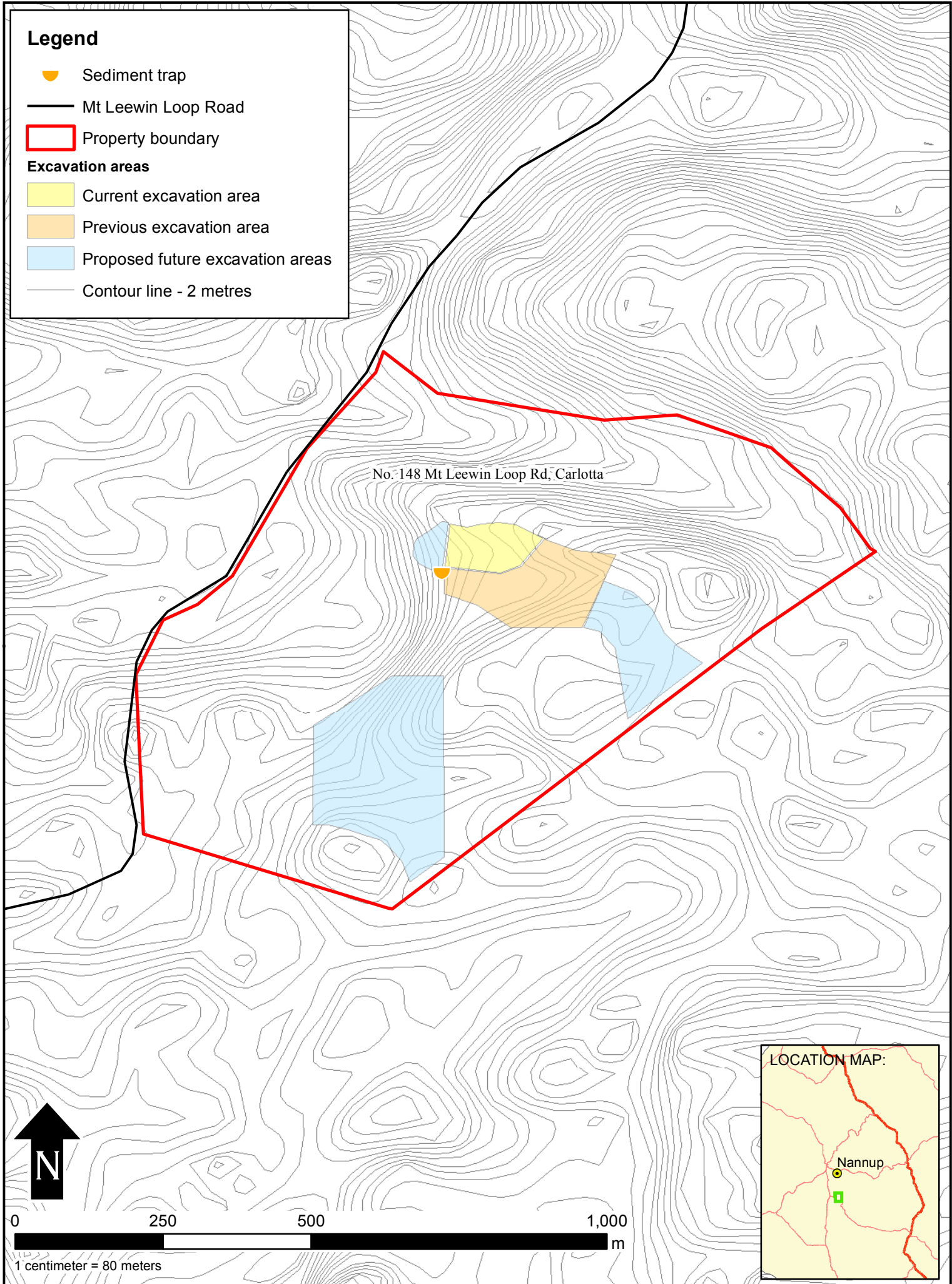
No. 148 Mt Leewin Loop Road, Carlotta, WA
Topography

Figure: 2
Project:
Coordinate System:
GDA 1994

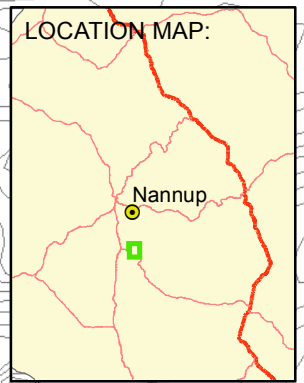
Drawn: CNH
Date: 2019-11-26
A4

Legend

-  Sediment trap
-  Mt Leewin Loop Road
-  Property boundary
- Excavation areas**
 -  Current excavation area
 -  Previous excavation area
 -  Proposed future excavation areas
-  Contour line - 2 metres



No. 148 Mt Leewin Loop Rd, Carlotta



Base map:
Contours derived from
2sec ASTER data.



No. 148 Mt Leewin Loop Road, Carlotta, WA
Topography - 2 metre contours

Figure: 3
Project:

Drawn: CNH
Date: 2019-11-27

Coordinate System:
GDA 1994

3 Operations and Potential Impacts

The current excavation operations have received no complaints or registered concerns from nearby residents, and this operation has been active for a period of fifteen years.

Overland flow of stormwater can occur from stripping the topsoil and extractive operations and transport sediment downstream. Management of this potential impact is vital to maintain the active working area of the pit and to reduce scouring and sediment transport to waterways.

The current and proposed excavation areas are located on contours higher than the sediment trap which permits stormwater management to occur in advance of any potential discharge to the surrounding environment (ie runoff is directed to the low point of the quarry). A sediment trap is located to the west of the current pit area which has never overflowed and released sediment to the environment (see Figure 3). Any stormwater collected in the trap from the quarry dissipates back into the soil or evaporates. No pumping is required.

An overflow channel will be constructed in the event that excess stormwater collects in the sediment trap and this channel will divert stormwater downhill to the nearest farm dam.

Given the topography of the area and the nature of the ground material, it is unlikely that there will be any impacts from expression of surface water within the current or proposed extraction area. No groundwater exposure or contamination from the proposed extractive activities is anticipated.

4 Actions

Management actions for identified risks are provided in Table 1 below.

Monitoring	Risk	Action
Visual stormwater/sediment collection in sediment trap	Overflow of water/sediment from trap	Silt will be trapped in the sediment trap and allowed to settle. The water collection point (trap) will prevent the outflow of sediment from the quarry
Complaints register	Complaint	Manager to assess stormwater levels/sediment burden and notify complainant of outcome of conditions and actions taken (if any)

Table 1. Drainage Management Actions

5 Drainage Post-Rehabilitation

Drainage of the rehabilitated quarry will consist of re-establishment of the contours to maintain suitable pasture and allow for water movement to freely drain over the surrounding environment. The area will not be compacted.

6 Document Review

Worthy Contracting will review all site management documentation on an annual basis. Any alterations/improvements to reflect the operational activities at the site will be updated in future documents.

7 References

Churchward, H.M. 1992. Soils and Landforms of the Manjimup Area, Western Australia. Land Resource Series No. 10.

Department Mines and Petroleum, Map Sheet si5010, Pemberton. Local Geology Descriptions.

3 Operations and Potential Impacts

The current excavation operations have received no complaints or registered concerns from nearby residents, and this operation has been active for a period of fifteen years.

Nuisance dust levels are a potential impact from operational activities. However, it must be noted that due to the experience of the operator, if wind conditions are unfavourable then dust generating activities will be avoided on these days. Visual monitoring of dust emissions is standard practice onsite and is considered the first line of action in relation to dust management. Weather condition monitoring also occurs on a daily basis. To improve reduction of dust emissions, water spraying is implemented as required.

3.1 Soil Removal

The proponent commits to:

- Develop the quarry in a staged process so that potential impacts from soil removal are limited to the various stages of the quarry extraction;
- Remove topsoil in the wetter months or when wind conditions are favourable for minimal dust generation;
- Ensure that dust reduction (spray trucks) are utilised when required;
- Monitor the site by visual means during operations and stop work if wind conditions become unfavourable; and
- Provide a phone/email link on property signage and on the company website for nearby residents/complaints.

3.2 Quarry Operations

Dust management actions for quarrying operations (current and proposed) include:

- Watering of haul roads/pit floor/stockpiles if required (via visual observations);
- Watering and/or covering of loads if required; and
- Implementing speed restrictions within the quarry area.

4 Actions

Management actions for identified risks are provided in Table 2 below.

Monitoring	Risk	Action
Visual dust	Nuisance dust emissions observed/weather prediction	Staff to report observation to Manager. Manager will advise appropriate action.
Complaints register	Complaint	Manager to assess dust/wind data and notify complainant of outcome of conditions and actions taken (if any)

Table 2. Management Actions

APPENDIX D

Bushfire Management Plan

Shire of Nannup

Application for Development Approval
Extractive Industry (Gravel)

Worthy Contracting
Lot 101 (#100, #148)
Mt Leewin Loop Road
Carlotta W.A.

Bushfire Management Plan



Project 38029
December 14, 2019



Wittenoom Consulting Engineers
Chartered Engineers and Project Managers

P.O. Box 12, Bridgetown WA 6255

Telephone: 9761 1531 Fax: 6210 1495 Mobile: 0427 611 511

Email: bridgetown@wittenoom.com.au ABN 44 008 819 243



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1 INTRODUCTION

This Bushfire Management Plan (BMP) is prepared in support of an application for renewal of the Nannup Shire Extractive Industry Licence for the gravel pit operations of Worthy Contracting on Lot 101 (No. 148) Mount Leewin Loop Road, Carlotta WA.

It details the Fire Management methods and requirements to be implemented within the expanded gravel extraction operations on Lot 101, as required by the Shire’s Extractive Industries Policy. This BMP forms part of and should be read in conjunction with the report entitled “Extractive Industry Application and Environmental Management Plan (EMP), Lot 101 Mount Leewin Loop Road, Carlotta”, prepared for Worthy Contracting by Abrus Consulting Pty Ltd in November 2019.

The objective of this Bushfire Management Plan is to ensure that the development is optimised to deliver the Fire Safety objectives of State Planning Policy 3.7 and Guidelines during currency of the Licence.

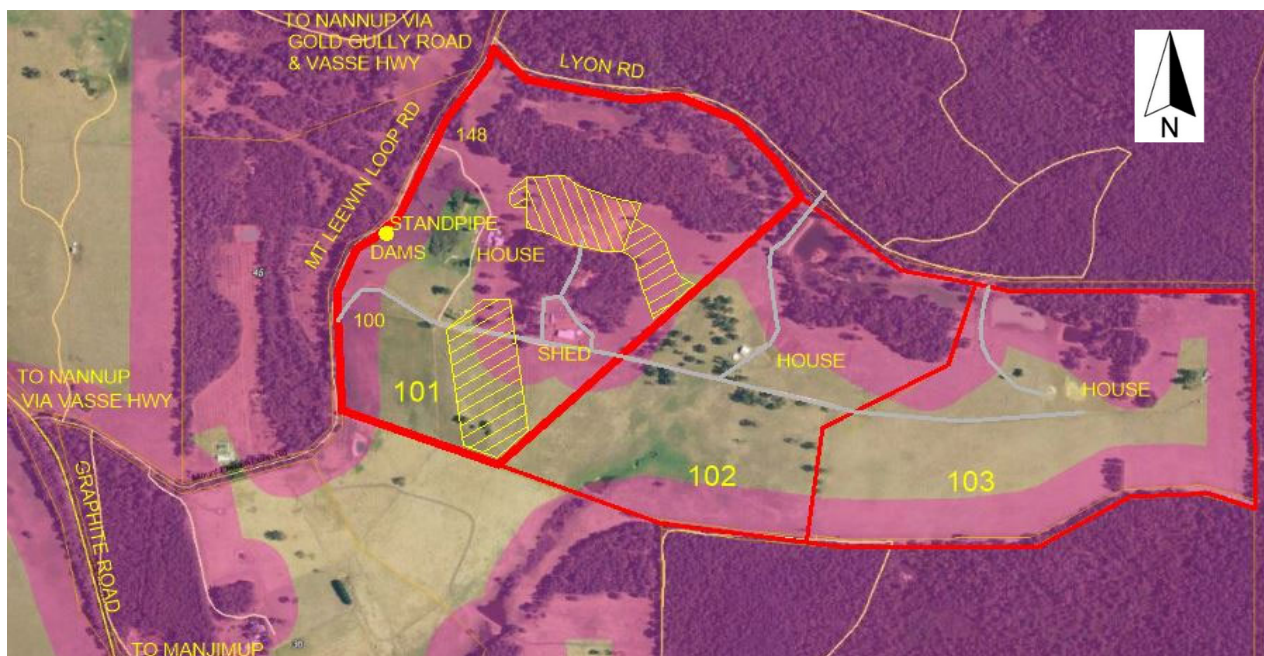


Figure 1: Locality and Layout Plan



1.1 Locality

The locality and the site are shown in Figure 1, above.

The property is situated about 15 km south east of Nannup. The gravel pit access road is 1000 m north east of Graphite Road on Mount Leewin Loop Road, (Rural Street Address 100), and the house access driveway is 1480 m from Graphite Road, Rural Street Address 148, Mount Leewin Loop Road. Mount Leewin Loop Rd is 2.6 km from Vasse Highway, and Graphite Rd is 13 km from Nannup.



1.2 Owner

The three lots shown (101, 102 & 103) were subdivided from a family farm with Lot 101 on Plan P65066 purchased by Benjamin Worthington. The property is owned and operated (the farm and gravel extraction operations) by the Worthington Family Trust trading as Worthy Contracting.

1.3 Operator

The Operator for the purposes of this Plan is Worthy Contracting, managed by Benjamin Worthington.



Figure 2: View east from Standpipe on Mount Leewin Loop Road. House is hidden by dam wall. Edge of Stage 1 extraction area can be seen on horizon left of centre trees. Future stages will extend to the right of the picture. The shed is behind the central trees.



2 DETAILS OF SITE

A contour plan of the area north of the entrance road to the gravel operations is set out in Figure 4, Page 5.

The eastern lots of the original farm are part of the original forest covered plateau, with level varying from 250 to 270m AHD. Two valleys intrude into the western half of Lot 101, one central in the western boundary, the other just inside the north (Lyon Rd) boundary. The eastern half of Lot 101 is elevated plateau.

As is normally the case the principal deposits of laterite are in the elevated plateau, generally within the range 240 m to 270 m. Depth of laterite is between 1 and 2 metres of caprock and gravel. Generally slopes in the extraction areas range from 3% to 8%.

The present extraction area was previously cropped farm land between stands of remnant forest. A 5 ha plot of tall jarrah marri forest forms the SW border of the existing pits. A 700m by 120 to 150 m wide strip of tall forest forms the NE border of this area. These stands of forest can be seen in Figure 2, previous page.

Across Lyon road, which serves two farms to the east of the site on Lots 102 and 103, is dense Jarrah Marri State Forest.

The cleared areas are cropped for grazing and hay production. See Fig 9, page 8.

The area is zoned as Agriculture Priority 2 in terms of the Shire of Nannup Local Planning Scheme No 3. It is anticipated that the extraction areas will be returned to grazing and pastures on completion of extraction.



Figure 3: View north from main entry road showing alternative exit past house to driveway RSN 148.



3 BUSHFIRE RISK

3.1 Fire Hazard Assessment to SPP 3.7

Figure 2 (below) shows Bushfire Hazard Levels (BHL) at significant locations identified on the drawing. These are derived as set out in Appendix Two of the Guidelines for Planning in Bushfire Prone Areas referenced in State Planning Policy 3.7, as follows:

- Class A Forest: EXTREME (E)
- Class G Grassland including crops: MODERATE (M)
- Any classified vegetation with slope greater than 10 degrees: EXTREME (E)
- Mineral earth areas in working gravel pits: LOW (L)
- Low Hazard vegetation (i.e. not gravel pits) within 100 m of moderate or extreme: MODERATE (M).
- Mineral earth gravel pit areas are LOW and may be used as refuges.

The majority of the site is thus either EXTREME or MODERATE, as shown in Figure 2 (below)

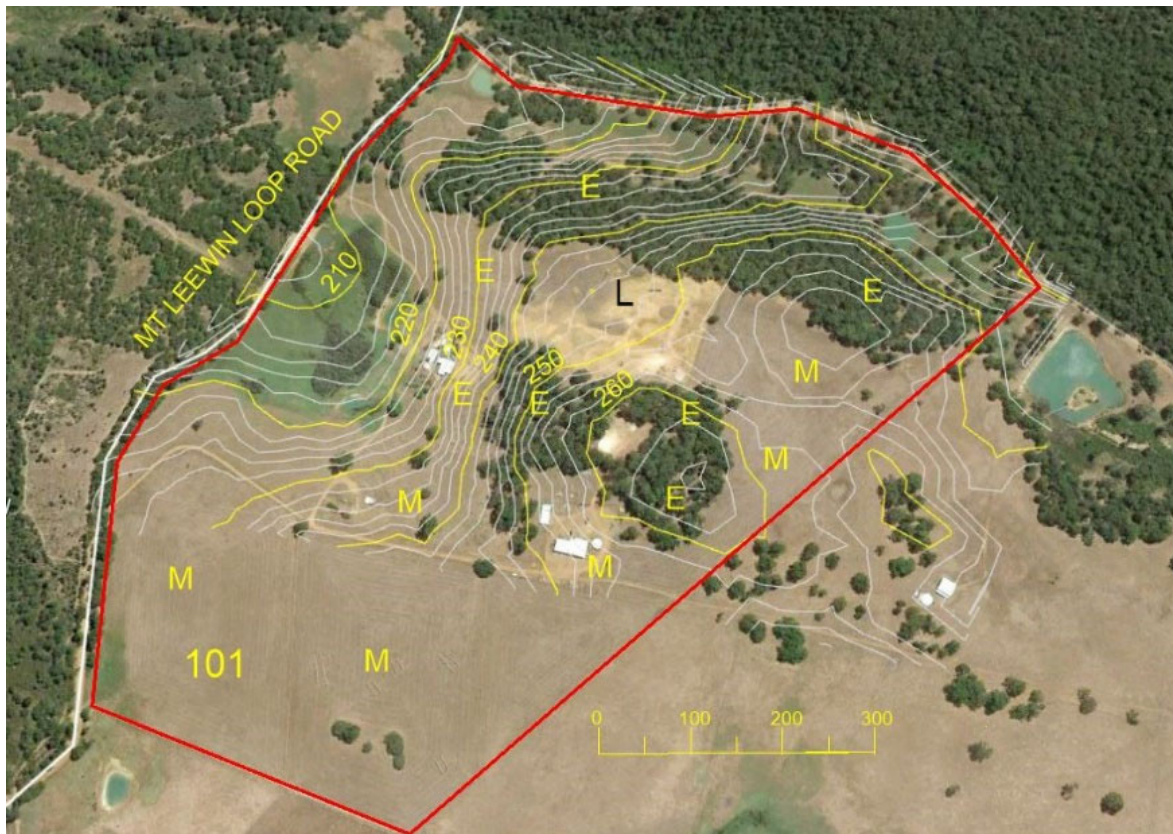


Figure 4: Contours and Hazard Levels Lot 101



3.2 Significant Threats

The most significant threat is the area of dense forest across Lyon Road on the north and east of Lot 101. Under hot north or north east winds a fire in this area is likely to spot over into Lot 101.



Another block of forest is on the south east of Lot 101. The degree of risk to the operations on Lot 101 will depend on whether the crop in lots 101 and 102 is standing or has been harvested.

Forest plots on the west of Mount Leewin Loop Road are more disseminated and the area of dams and green vegetation between the house and Mount Leewin Road is more likely to resist spotting.

The plots of forest in Lot 101 are mature tall jarrah and marri, but well maintained with a clear understorey, being burnt every 3 or 4 years by the owners. An area on the south west of the Shed has recently been felled to enlarge the clearance around the shed (see Fig 5).

3.3 Access and Escape

The road system on Lots 101 to 103 was shown in Figure 1. Access for fire appliances runs from 100 Mt Leewin Loop Road to the shed in the east of Lot 101. Half way up this road a road runs north to the front of the main house and then turns to meet Mount Leewin Loop Road at RN 148. (See Fig 9, page 4).

In the event of a fire from the south west the main entry road continues past the shed to the homestead of Lot 102 and Lot 103. From either of these Lyon Road can be accessed.

In the event external roads are cut off by fire the existing Stage 1 gravel pit area, which is about 100 metres width of mineral earth between the internal tree plots, can serve as a refuge.



Fig 5: Completed Stage 1 area, now used as a stockpile and processing area, can serve as a refuge.

3.4 Initial Assembly Point

The initial assembly point in a fire is the Shed, which is in a large cleared area and could also serve as a refuge. The trees shown in Figure 6 (below) previously wrapped around the buildings towards the road. These have recently been cleared back to the line shown, adding to the safety of the shed. The understorey of the trees shown is regularly burnt at about 3 or 4 year intervals.



Fig 6: The main shed.



3.5 Water

The property is extremely well served by water sources. There are large dams below the house with adequate clearances for helicopter upload. As well there are other dams at various points on this and adjacent Lots.



Fig. 7: Dams in the central valley fronting Mount Leewin Loop Road.

A standpipe located in a slip road off Mount Leewin Loop Road at the front is fed by gravity from a dam in an elevated location towards the main entry road by a 100 mm line. This standpipe has a capacity of 830 litres/min.

At the shed is a 125 kl tank fed by rainwater from the shed roof.

Included in the plant on site is a water cart with 2 side sprays delivering 1500 litres/min. This can be fitted with 2 x 75 layflat hoses serving 50mm spray nozzles.



Fig. 8: Gravity fed standpipe off Mount Leewin Loop Road.



4 SHIRE OF NANNUP BUSHFIRE REQUIREMENTS

4.1 Fuel Hazard Reduction & Firebreak Notice 2019-2020 (“the Notice”)

The operator shall comply with all relevant requirements of the above Notice, as required under Part 3, Division 6, Section 33 of the Bushfires Act 1954, to carry out fire prevention work and maintain access for fire fighting vehicles in compliance with the Notice.

During the Maintenance Period (1 November to 1 June) the property must be maintained and be compliant as per the Notice. The property is classified as Rural Managed Land. Properties with this classification must have active fuel reduction carried out during the maintenance period.

4.2 Fuel Reduction

Active fuel reduction is to be by grazing by an appropriate stocking rate of livestock, slashing and baling or other approved fuel reduction plan.

4.3 Firebreaks

Managed land is not required to have perimeter firebreaks, although land owners and occupiers are encouraged to install them in strategic places to protect the property and provide access for fire fighting appliances in the event of a fire.

Where provided fire breaks should be:

- Within 6 m of the boundary
- 4 m wide with minimum of 3 m to be mineral earth
- Trees on both sides to be laterally pruned to a height of 4 m.

4.4 Habitable Buildings

Create and maintain a Bushfire Protection Zone (BPZ) around the Manager’s house as specified in the Notice.

4.5 Buildings, haystacks and fuel storage areas

Slash and remove all flammable materials likely to create a fire hazard, except living trees and shrubbery for at least 20 m around the object.



Figure 9: East paddock under crop as at 18 October 2018. This was to be slashed and baled by November 1.



5 RESPONSIBILITIES OF OPERATOR

The management of the risk posed by bushfires is a shared responsibility between landowners, government and industry. Responsibility of the Owner/Operator includes:

5.1 Maintain condition of the property

Ensure that all aspects of the property comply with the requirements for fire safety.

5.2 Provide Shed as central Assembly Point.

Provide two fire extinguishers in shed.

5.3 Safety of personnel

Ensure that employees or contractors are not placed in danger

Provide on site suitable personal protective equipment (PPE) if they are expected to fight the fire.

5.4 Provide adequate plant to support fire suppression operations

When operations are carried out plant on site is as follows. All plant to be equipped with fire extinguishers and regularly used plant fitted with UHF radios.

- 1982 Ford 12T Tipper Body Rigid Truck
- 1982 Ford Water Truck (Tank Capacity 10,500L)
- 2002 Iveco PowerStar Prime Mover
- 1977 Custom Built Low Loader 3 Axle Semi Trailer
- 1998 Kobelco SK200 KV Excavator – with various attachments
- 1993 Komatsu D57S Traxcavator
- 1987 Caterpillar 931B Traxcavator
- 1990 Samsung SL180 Front End Loader
- 1986 Caterpillar D7G Bulldozer
- 2005 Komatsu PC220-7 Excavator – with various attachments
- 2005 S250 Bobcat Skid -Steer Loader – with various attachments
- Water Trailer

5.5 Liaison with the Shire and the local Bushfire Brigade.

Each year prior to the wildfire season (commencing September/October), Worthy should familiarize the local Bush Fire Brigade of site access, firebreaks, water supplies, equipment available on site and contact details of authorized personnel for the site. This will enable the Brigade to plan their actions in the event of a fire on site, as well as provide them with enough background information in the event of a wildfire on or near the site.

The Manager is a member of the Carlotta Brigade.



5.6 Provide adequate signage to assist arriving Appliances.

Sign(s) at main entrance to include:

- 100 Mt Leewin Loop Rd
- Use Channel 40
- Manager: 0427 190 398
- Office: (08) 9756 1071 | 0428 560 150

5.7 Phone contacts

Contacts from Shire Fire Hazard Reduction Notice to be laminated and posted in the shed.



Fig. 10: Typical heavy plant stored in Shed.



6 EMERGENCY PROCEDURES

The Manager must ensure that personnel on site are thoroughly briefed on actions required in case of fire.

Personnel fighting the fire should wear appropriate Personal Protective Equipment (PPE).

- Assembly point for all personnel to be the main shed;
- All personnel on site to be notified immediately of fire;
- Responsible person on site to report fire to FESA Operations by ringing '000' and providing all known details on the fire including location, type of vegetation burning, intensity, smoke level;
- If safe to do so, onsite personnel and equipment to be used to extinguish the fire using fire extinguishers, water cart, plant and equipment;
- Relocate personnel and equipment to a safe area;
- Create a fire break around the fire if possible, only if it is safe to do so. Do not put any personnel or equipment at risk;
- On arrival of Fire Brigade, site supervisor to take directions from the most senior Brigade Officer (Incident Controller) on site. Worthy Contracting personnel to follow their own chain of command (Manager/team leader);