



**Supporting Information for a Native Vegetation Clearing Permit Application
for the Range Quarry on M08/272**

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Annex 3 Spectrum Ecology (2020). M08/272 Targeted Weed Survey & Seed Mix Development. Spectrum Ecology, August 2020.

Annex 4 Egernia Environmental (2011). Vertebrate Fauna Desktop Assessment for Cane River proposed exploration area, Onslow, WA. Egernia Environmental (Dr Robert A. Davis), June 2011.

Acronyms

| | |
|---------------|--|
| BOM | Bureau of Meteorology |
| DBCA | Department of Biodiversity, Conservation and Attractions |
| DMIRS | Department of Mines, Industry Regulation and Safety |
| DPIRD | Department of Primary Industry and Regional Development |
| DPLH | Department of Planning, Lands and Heritage |
| DWER | Department of Water and Environmental Regulation |
| IBRA | Interim Biogeographic Regionalisation for Australia |
| ESA | Environmentally Sensitive Areas |
| MCP | Mine Closure Plan |
| MCS | Mobile Concreting Solutions Pty Ltd |
| MP | Mining Proposal |
| NVCP | Native Vegetation Clearing Permit |
| Onslow Metals | Onslow Metals Pty Ltd |
| PEC | Priority Ecological Community |
| PDWSA | Public Drinking Water Source Areas |
| RL | Relative level Australian Height Datum |
| TEC | Threatened Ecological Community |

Units of measurement

| | |
|----|----------------|
| ha | hectare |
| m | metres |
| km | kilometre |
| °C | degree Celsius |

1 BACKGROUND INFORMATION

1.1 INTRODUCTION

Mobile Concreting Solutions Pty Ltd (MCS) is the registered tenement holder (100%) of M08/272, having acquired this lease and associated quarrying operation from Onslow Metals Pty Ltd (Onslow Metals) in 2019/2020. The transfer from Onslow Metals to MCS was officially registered on 16/04/2020. M08/272 contains the existing hard rock (aggregate) Range Quarry that was worked by previous lessees. The Range Quarry supplies armour rock, dimension stone and crushed aggregate materials for use in local major developments, road construction and concrete manufacture.

The site has not been operational since about 2017 when it went onto care and maintenance. MCS now intends on recommencing quarrying operations at the Range Quarry and this will require a Mining Proposal (MP), Mine Closure Plan (MCP) and a Native Vegetation Clearing Permit (NVCP). The document provides the supporting information for the NVCP application.

The regional location of the Range Quarry (M08/272) is displayed in Figure 1. M08/272 is located approximately 75km of south-southeast of Onslow in the Ashburton region of Western Australia (Figure 1). The locality map for M08/272 is displayed in Figure 2. M08/273 is part of a group of tenements now held by MCS; M08/273, L08/72 and L08/130 (pending). The aerial image for the Range Quarry location is provided as Figure 3. Only M08/272 has currently been developed with no mining activities on M08/273 (Figure 3). The Range Quarry is connected to the Onslow Road by a previously sealed road (Road 7912) that is now under application as L08/130. L08/72 connects L08/130 to M08/272 and M08/273 (Figure 3). Photos of the Range Quarry and local vegetation are provided in Plates 1 to 4.

The land tenure map is provided as Figure 4. M08/272 is contained entirely within the Cane River Conservation Park (Reserve 46122) that is managed by the Department of Biodiversity, Conservation and Attractions (DBCA) on behalf of the Conservation Commission of WA. M08/272 and the other tenements are also contained entirely within the Shire of Ashburton. The surveyed area of M08/272 is 119.97ha.

Range Quarry was commenced by Onslow Metals in 2012 as approved by the Department of Mines, Industry Resources and Safety (DMIRS) under MP-MCP 34192 on 03/08/2012. The Project is also subject to a second mining proposal (MP 55292) submitted in 2015 for a proposed expansion of the southeastern section of the quarry and relocation of the crushing/screening plant and ROM pad. MP 55292 was approved on 23/12/2015.

Due to its location in a conservation reserve, the original development of the Range Quarry required an NVCP. CPS 5038/1 was issued to Onslow Metals as a purpose permit for 11.8ha of clearing within part M08/272 for the duration 04/08/2012 to 31/07/2017. The area of allowed clearing was increased later in 2012 to 29.5ha in under CPS 5038/2. CPS 5038/2 expired on 31/07/2017.

MCS took over management of Range Quarry in January 2019, and following consultations with DMIRS, embarked on program of reviewing and rectifying outstanding environmental issues.

MCS has also developed and a conservation management plan and communication plan for operating within the Cane River Conservation Park that has been endorsed by DBCA. Mr David Pickle from DBCA met with MCS personnel on site on 24/03/2020 as part of the consultation process for the conservation management plan and communication plan.

As mentioned above, MCS has prepared an MP for the recommencement of quarrying at M08/272. It is intended on expanding the existing quarry in an easterly direction. The additional quarry resources within this expansion area will increase the mine life by > 30 years.

When MCS took over M08/272, the quarry had not been worked for many years and much of the mining and associated infrastructure had been removed. The current site layout is displayed in Figure 5 using a drone photo from 14/02/2021. The site has remained unchanged for at least 4 years. The area of proposed expansion is also displayed in Figure 5. The expanded quarry will utilise areas within the existing disturbance footprint as well as extending 350m onto new ground to the east (Figure 5). The existing infrastructure contained within the proposed expansion will be relocated to other areas with the quarry.

The area required for clearing to facilitate quarry expansion is displayed in Figure 6. The total area is 9.85ha and includes the geotechnical bund and associated buffers to include the zone of instability as per the geotechnical site assessment conducted by consulting engineers George, Orr and Associates in 2020. As with the existing quarry, mining will occur above the watertable.

The Range Project operates under a site MCP. An MCP has also been submitted along with the MP for the quarry expansion. The overall site MCP is due for update using the new statutory guidelines by October 2021.

Contact details for this NVCP are provided in Table 1.

Table 1: Contact details for this NVCP application

| Item | Description |
|-----------------|--|
| Tenement Holder | Mobile Concreting Solutions Pty Ltd (100/100) |
| Site Operator | Mobile Concreting Solutions Pty Ltd L1,985 Wellington Street West Perth WA 6005 http://www.mobileconcrete.com.au/ |
| Contact Person | Alessia Bellin QHSE Manager 08 9200 1840 0427 303 609 qms@mobileconcrete.com.au |

1.2 NVCP APPLICATION

The NVCP application is for a purpose permit to clear 30ha of native vegetation within the boundaries of M08/272. The proposed quarry expansion to the east involves the clearing of 9.85ha. This NVCP has applied for 30ha to facilitate two further expansions, to the west and to the south of the present quarry. There will also be a need to relocate screening and stockpiling areas as the quarry expansions occur. The 30ha of applied for area is also provision against unexpected site works. The current quarry expansion to the east and relocation of infrastructure is covered by the MP submitted at the same time as this NVCP. Other expansions and infrastructure relocations would be the subject of future MP submissions.

The purpose permit spatial area for this NVCP is provided by shapefile entitled: "NVCP_Application_Range_Quarry_M08_272.shp". The purpose permit area is identical to that of M08/272.

1.3 BASELINE SURVEYS

The Range Quarry area has been the subject of the following flora and fauna surveys:

- Botanica Consulting (2007). Flora and Vegetation Survey of the Turtle and Range Projects (M08/272 & M08/273). Botanica Consulting, June 2007.
- Newman Environmental (2011). Onslow Metals Turtle and Range Deposits Level 1 Flora Survey, Newman Environmental, June 2011.
- Egernia Environmental (2011). Vertebrate Fauna Desktop Assessment for Cane River proposed exploration area, Onslow, WA. Egernia Environmental (Dr Robert A. Davis), June 2011.

All flora and fauna reports are provided as attachments to this NVCP application.

Please note that IBSA data is not available or required as these surveys were undertaken many years before the IBSA was introduced.



Plate 1: Typical native vegetation at M08/272 (from Spectrum Ecology 2020)



Plate 2: Another view of native vegetation at M08/272 (from Spectrum Ecology 2020)



Plate 3: The Range Quarry area prior to mining (from Botanica Consulting 2007)

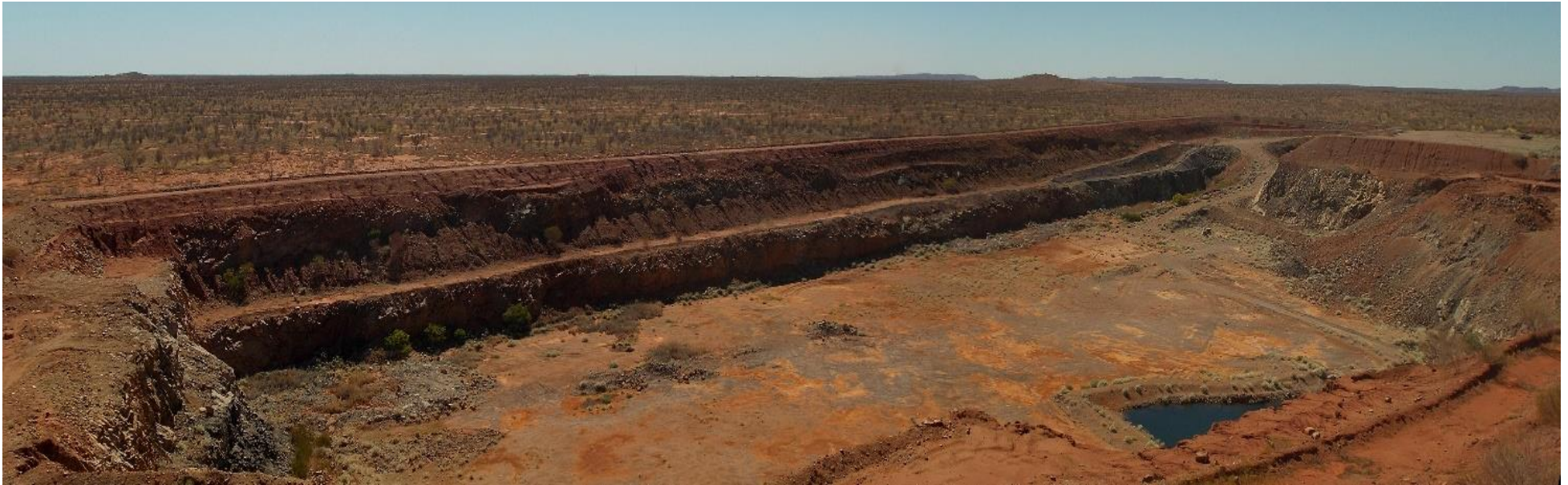


Plate 4: Range Quarry in current state (from George, Orr and Associates 2020)

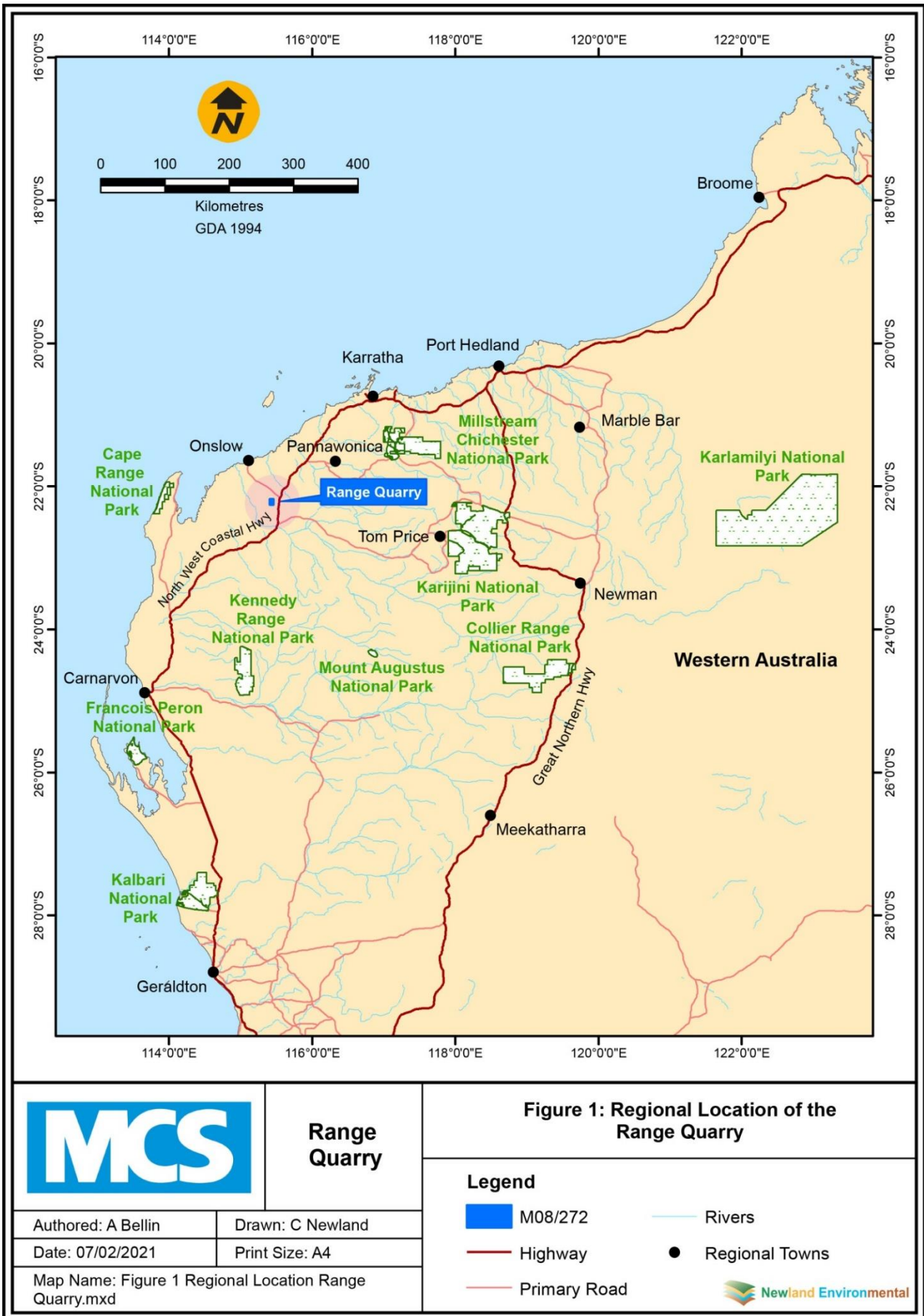


Figure 1: Regional location of the Range Quarry

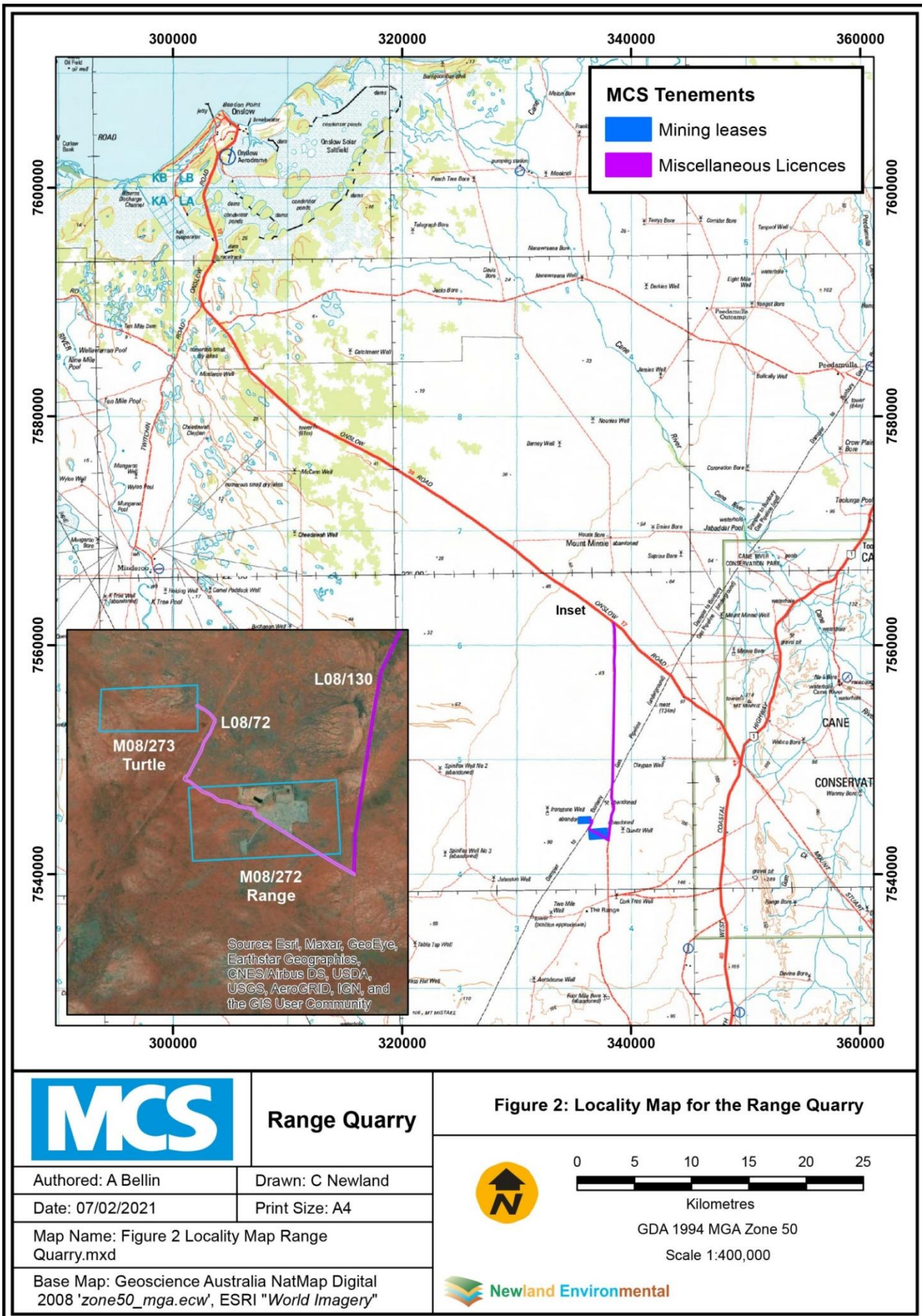


Figure 2: Locality Map for the Range Quarry

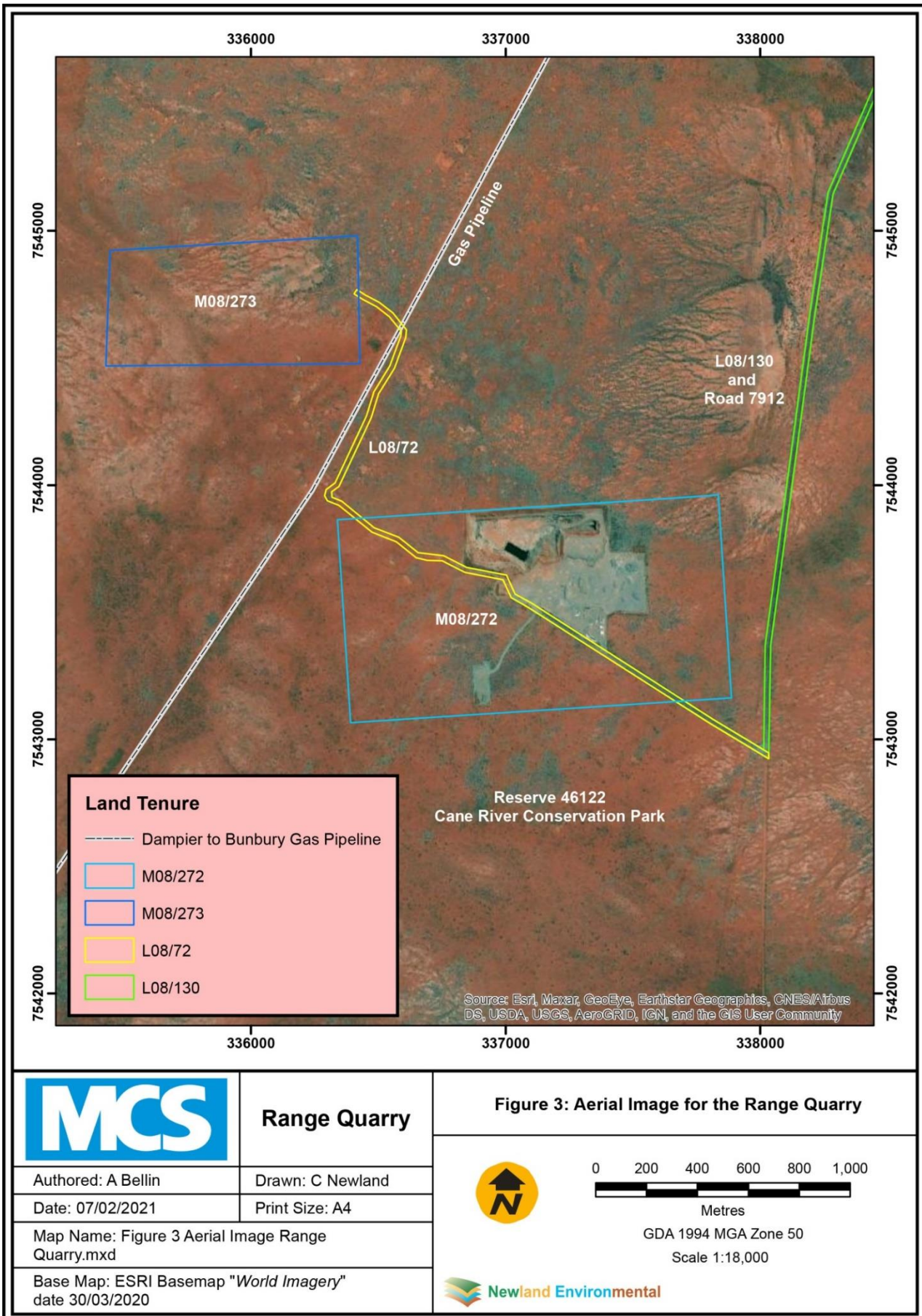


Figure 3: Aerial Image for the Range Quarry

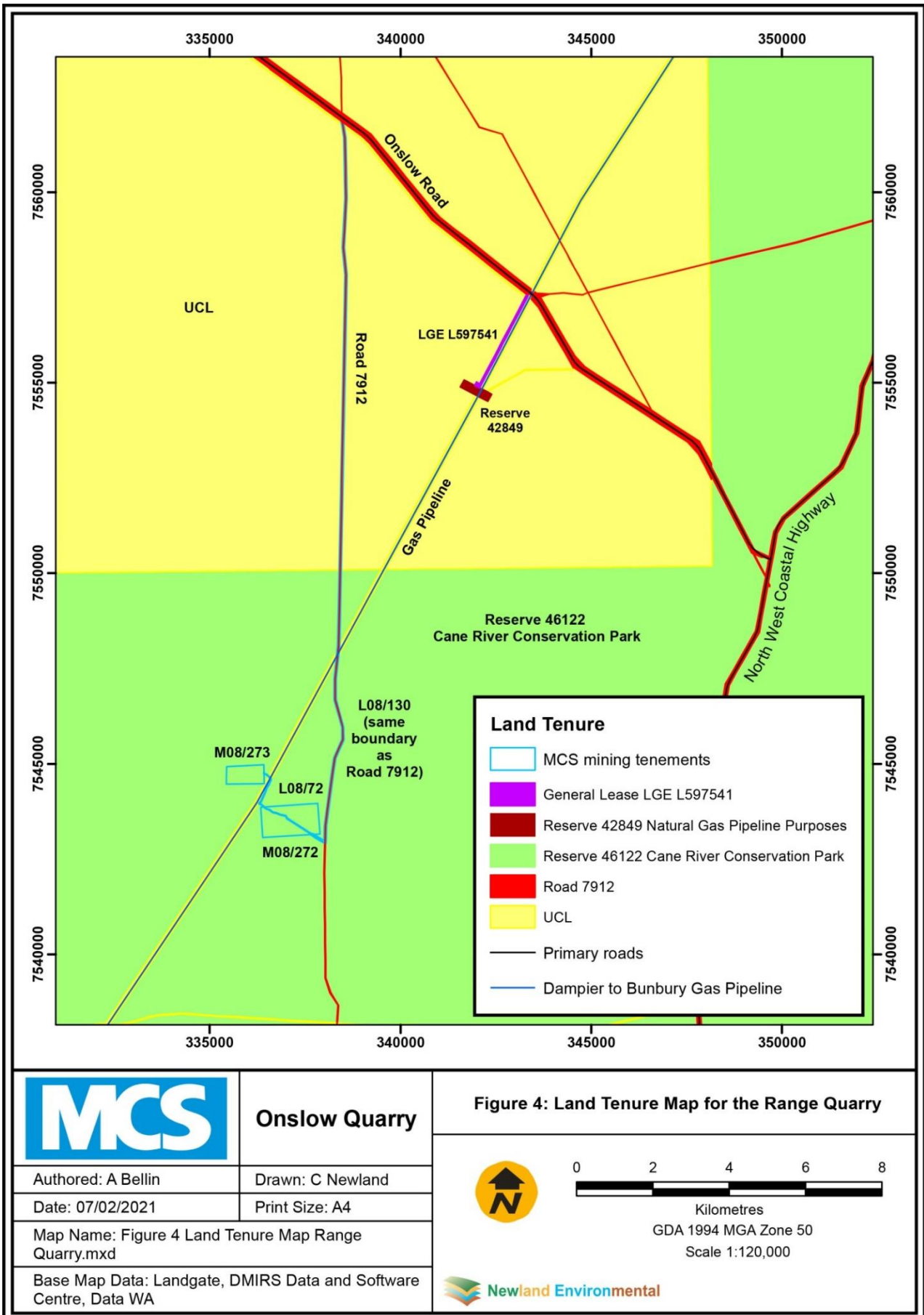


Figure 4: Land Tenure Map for the Range Quarry

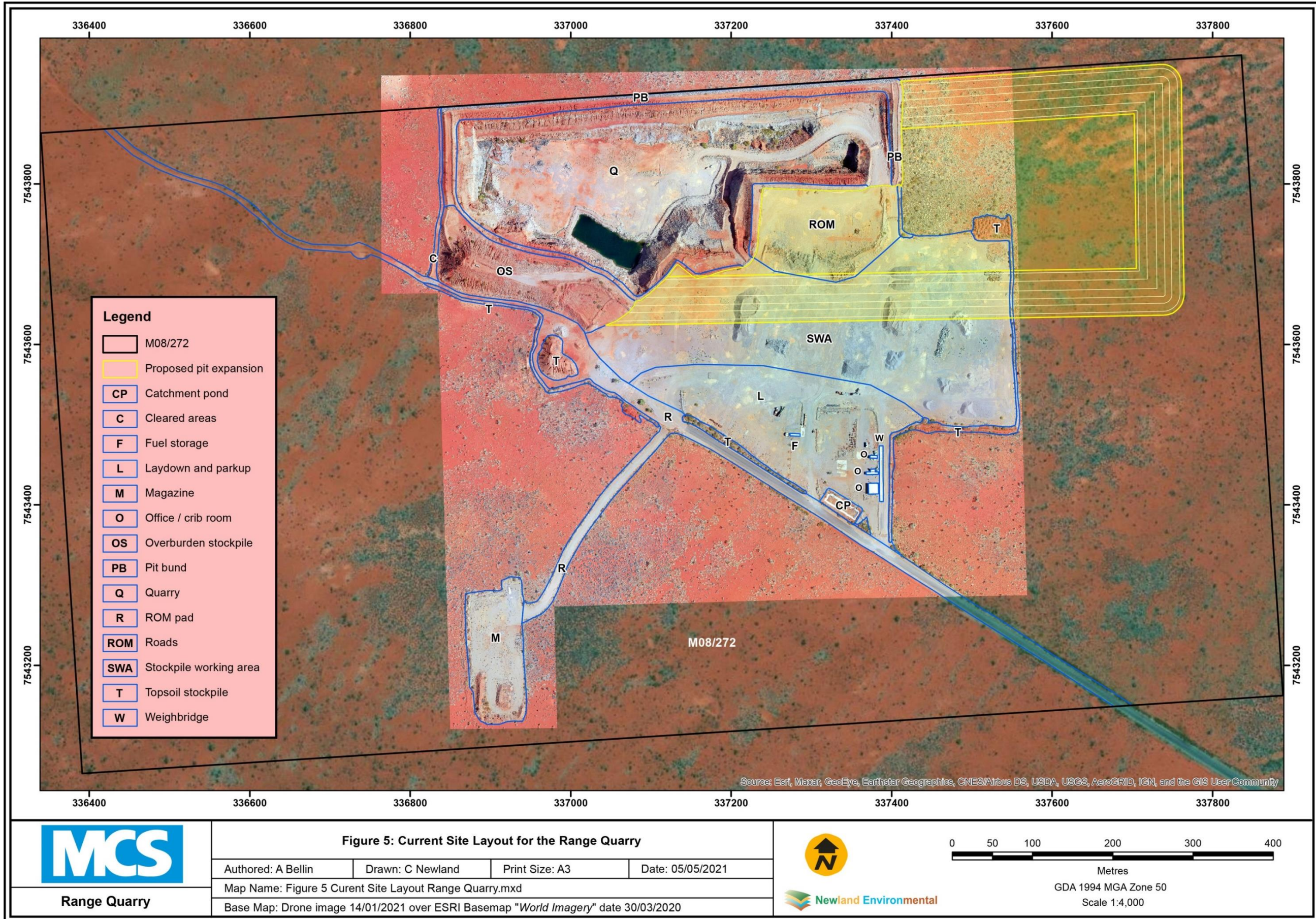


Figure 5: Current Site Layout for the Range Quarry

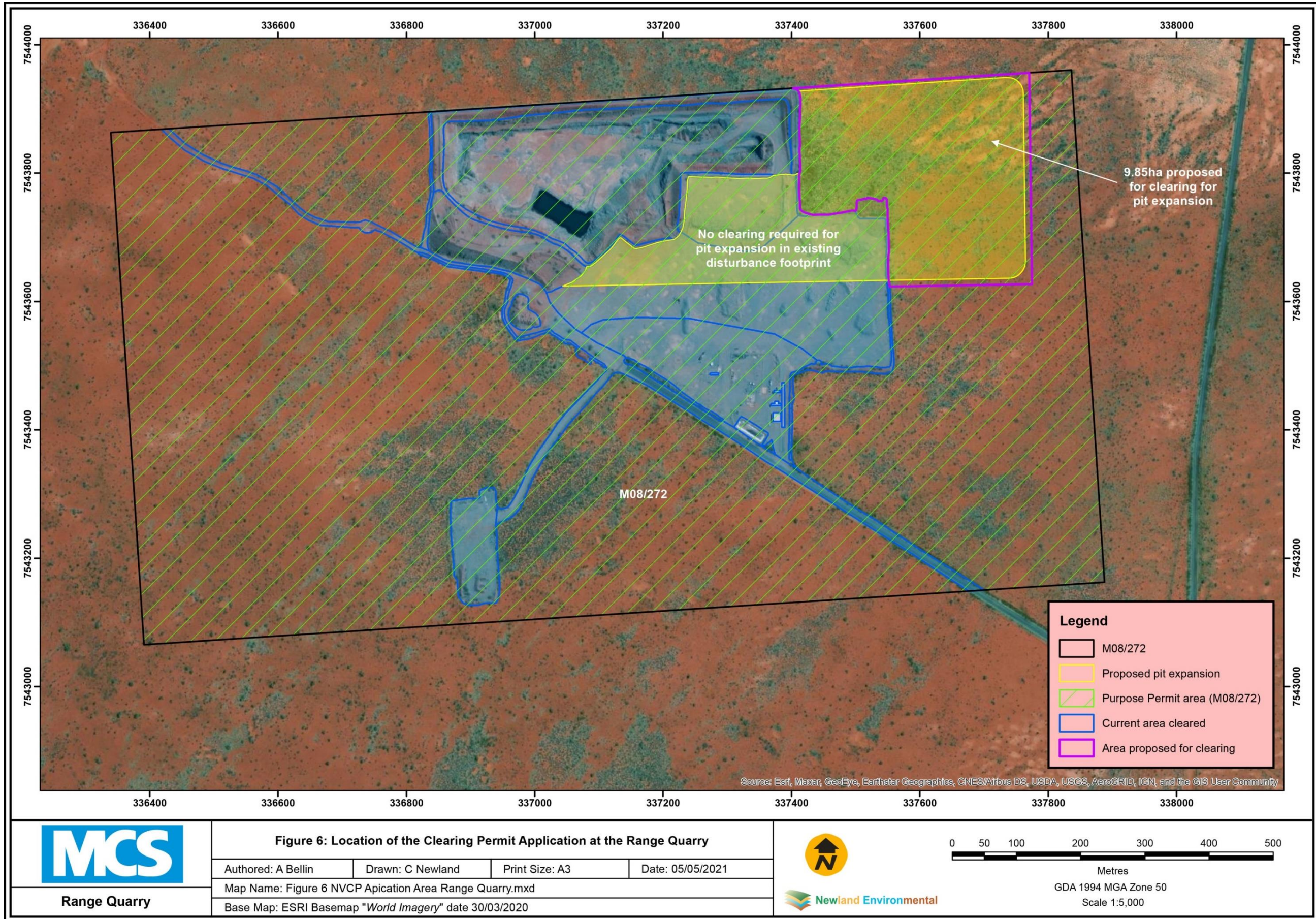


Figure 6: Location of the Clearing Permit Application at the Range Quarry

2 BASELINE ENVIRONMENTAL AND HERITAGE INFORMATION

2.1 CLIMATE

The summer season is characterised by long periods of hot, dry conditions created by the progression of anticyclones, occasionally broken by thunderstorms and tropical cyclones, causing large amounts of rain to fall in short periods of time (BOM 2021).

Cool, dry winter conditions are inconsistently broken by the incursion of rain-bearing depressions from the south. The inconsistency of the depressions northwards is responsible for the unreliable nature of rainfall.

Onslow Airport meteorological weather station is the nearest weather observation centre to the Project (Table 2, Figure 7). The average annual rainfall is 304.2 mm with the majority of rain usually falling between January and June (BOM 2021). The highest monthly rainfall on record is 374.9mm that fell in March 1958. Massive daily rainfalls can also occur such as 274.1mm on 12 February 1961. The massive cyclonic driven events have the potential to create massive flooding along the Ashburton River with erosional scoring on floodplains. The average daily evaporation rate is not recorded at the Onslow Airport BOM station.

The mean annual maximum temperature for Onslow is 32.1°C and the mean annual minimum temperature is 19.2°C. The average wind speeds for Onslow vary throughout the year from 15.2-21 km/h in the morning to 17.5–28.9 km/h in the afternoon. Humidity data for Onslow shows humidity levels vary considerably both daily and yearly. The mean monthly 9.00am relative humidity varies from a low of 42% in October to a high of 63% in June. The mean monthly 3.00pm relative humidity varies from a low of 38% in October to a high of 53% in February.

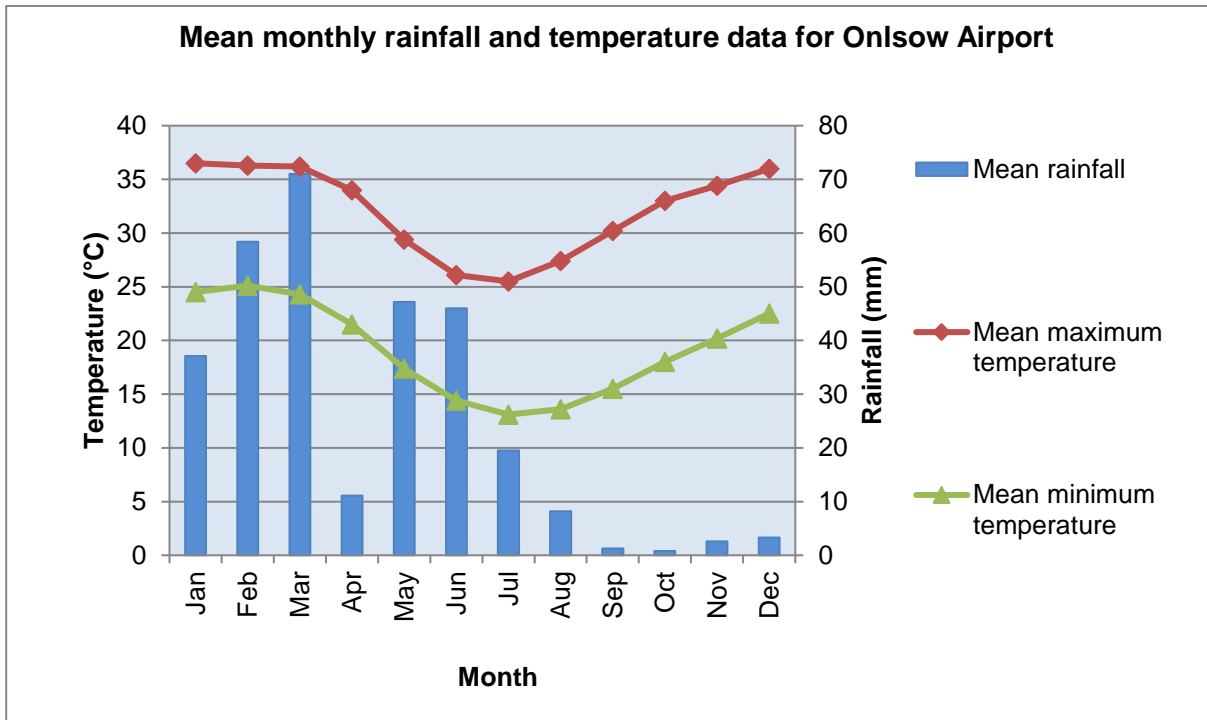


Figure 7: Mean Monthly Rainfall and Temperature Data for Onslow Airport BOM Station No 5017

Table 2: Climate averages for Onslow Airport BOM Station No 5017

BOM Station 5017 1940 to present

| Statistic Element | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|--------|
| Mean maximum temperature (°C) | 36.5 | 36.3 | 36.2 | 34 | 29.4 | 26.1 | 25.5 | 27.4 | 30.2 | 33 | 34.4 | 36 | 32.1 |
| Highest temperature (°C) | 48.9 | 48.1 | 47.2 | 43.4 | 38.8 | 33.5 | 33.4 | 37.7 | 40.7 | 46 | 44.8 | 49.2 | 49.2 |
| Mean minimum temperature (°C) | 24.5 | 25.1 | 24.3 | 21.5 | 17.4 | 14.4 | 13.1 | 13.6 | 15.5 | 18 | 20.2 | 22.5 | 19.2 |
| Lowest temperature (°C) | 16.3 | 18.2 | 16 | 11.8 | 7.5 | 3.5 | 4 | 5.1 | 8.4 | 11.5 | 13.1 | 16.4 | 3.5 |
| Mean rainfall (mm) | 37.1 | 58.4 | 71 | 11.1 | 47.2 | 46 | 19.5 | 8.2 | 1.3 | 0.8 | 2.6 | 3.3 | 304.2 |
| Highest rainfall (mm) | 275.6 | 358.6 | 374.9 | 163.4 | 236.7 | 230.8 | 115.4 | 81.8 | 24.7 | 15 | 60.2 | 54 | 1085.1 |
| Lowest rainfall (mm) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |

2.2 REGIONAL SETTING

The Interim Biogeographic Regionalisation for Australia (IBRA) divides the Australian continent into 89 bioregions and 419 subregions (DOEE 2018a). The Range Quarry lies within the Roebourne (PIL4) Pilbara IBRA subregion (DOEE 2018a).

This subregion is characterised by quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *Acacia pyrifolia* and *Acacia inaequilatera* (Kendrick and Stanley 2001). Uplands are dominated by *Triodia* hummock grasslands (Kendrick and Stanley 2001). Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* spp. and mangal occur on marine alluvial flats and river deltas (Kendrick and Stanley 2001).

2.3 LOCAL SETTING

The Range Quarry is south of Onslow in the general vicinity of the historical Turtle copper resource and the historical Range lead mine. M08/272 contains an existing aggregate quarry that is currently not operating. The aerial image of the Range Quarry area is provided as Figure 3.

The Range Quarry area is encompassed within a low relief sandy plain with no distinct drainage patterns. The sandy plains that dominate the area are expansive and regional. There were no outcrops visible on the surface in M08/272 prior to mining. Occasional calcrete nodules extend to surface, derived from alluvial calcrete deposits as part of the Tertiary palaeo-drainage of the area.

The contour map is provided as Figure 8. Topography at M08/272 gradually rises from 80m RL on the western boundary to 85m RL on the eastern boundary (5m rise over 1500m horizontal length or a gradient of 0.0033).

2.4 TENURE

The Project is located entirely within Crown Reserve 46122 Cane River Conservation Park, refer to Figure 3. The Cane River Conservation Park is managed by the DBCA for the purpose of conservation and vested with the Conservation Commission.

2.5 HYDROLOGY

There are no lakes, rivers or other significant water bodies near the Range Quarry Project area. Several minor drainage lines occur as displayed in Figure 8.

Groundwater occurs approximately 30m below the surface as indicated from drilling undertaken at the site and the actual quarry depth. Mining of the quarry does not require pit dewatering as mining does not occur below the watertable. Water for processing, dust suppression and potable use is sourced off site by Onslow. Under the new mining proposal, two water bores are proposed to supply water for dust suppression and camp use.

The Project area is confined to the Ashburton River catchment. The Project area is contained in the Pilbara Groundwater Area and Pilbara Surface Water Area under the Rights in Water and Irrigation Act 1914. There are no Public Drinking Water Source Areas (PDWSA) near the Range Quarry (DWER 2020). The closest PDWSA is the Cane River Water Reserve located approximately 48km to the north of M08/272.

2.6 GEOLOGY

The Project area occurs at the northern end of the Gascoyne high-grade metamorphic province. This northern section of the Gascoyne is near the contact with the overlying Ashburton region to the east. To the west are the much younger sediments of the Carnarvon basin. The Project resource is basalt surrounding a lead sulphide orebody. The lead sulphide mineralisation is controlled and restricted to chloritic shears in granodiorite. The mineralisation occurs as lenses of massive galena in quartz and quartzchlorite. The mining of quarry products from the quarry site does not produce acid drainage or contaminant effects upon any surface water or vegetation. The quarry activities do not occur in the lead sulphide orebody. Therefore, the sulphides will remain in situ. In addition, there will be no waste rock dumps constructed at the site.

MCS commissioned George, Orr and Associates in 2020 to conduct a geotechnical appraisal of the proposed eastern extension of the quarry in M08/272 (George, Orr and Associates 2020). The quarry had been excavated to a maximum depth of around 26m from surface (minimum floor elevation of about 56m relative level Australian Height Datum (RL) to natural ground surface of about 82m RL).

The rock types consisted of granite and granodiorite intruded by a dolerite body. The stratigraphy consisted of:

- 82m (surface) to 76m RL - completely weathered (soil like) rock.
- 76m to 66m RL - mixed highly weathered (oxide) and moderately weathered (transitional) rock.
- Below 66m to 56m RL (quarry floor) - slightly weathered rock.

2.7 SOILS

A soil survey was conducted by Keith Lindbeck & Associates in September 2004 of the Project area using a soil auger to examine the soil profile (CLA 2015). The soil profile comprised an A1, A2 and B horizon and was a clayey sand to a depth of 0 cm to 30 cm with a fine sandy clay loam subsoil from 30 cm to 45 cm depth. The soil profile was neutral on the surface (pH 7.8) to alkaline (pH 7.0) with very low levels of Nitrogen and Phosphorus. The horizons (and soils) were non-sodic.

2.8 LAND SYSTEMS

The Department of Primary Industry and Regional Development (DPIRD) land systems for the Range Quarry locality are displayed in Figure 9 (DPIRD 2011). The Range Quarry is located within the Uaroo and Stuart Land Systems (Figure 9).

The following descriptions and areas are taken from Van Vreeswyk *et al.* (2004) and Payne *et al.* (1988).

- Uaroo Land System: This Land System is dominated by sandy plains with hard and soft spinifex grasslands. Broad, mostly unchannelled tracts up to 3km wide extend downslope from the low hills and stony rises into largely unchannelled creeklines. This land system is generally not susceptible to erosion, however some erosion is present on drainage tracts (Van Vreeswyk *et al.* 2004). The total area from the Ashburton and Pilbara surveys combined is 1,220,000ha for the Uaroo Land System.
- Stuart Land System: Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands. Mainly erosional surfaces; minor hills, gently undulating stony plains and broad lower plains; moderately spaced tributary drainage tracts in upper parts becoming sparse and much broader downslope, may be channelled or unchannelled. This land system is generally resistant to erosion except for some lower plains and drainage tracts which are slightly to moderately susceptible (Van Vreeswyk *et al.* 2004). The total area from the Ashburton and Pilbara surveys combined is 302,400ha for the Stuart Land System.

Both the Stuart and Uaroo Land Systems are generally not susceptible to erosion, however both have some susceptibility to erosion within drainage tracts. There are no drainage tracts present within the NVCP application area. Therefore, the proposed clearing is not likely to cause appreciable land degradation.

2.9 STATE LEVEL VEGETATION ASSOCIATIONS

Mapping of the pre-European vegetation within Western Australia was conducted at a 1:250,000 scale by J S Beard from 1964 to 1981 (Beard *et al.* 2013). The type, status, pre-European area (based on Beard's mapping) and remaining extent of native vegetation for the entire state has been assessed by the DBCA and DPIRD using remote sensing techniques and GIS analysis to produce a statistical compendium called the 'Comprehensive, Adequate and Representative Reserves system (Shepherd *et al.* 2002). Data has been updated on a regular basis with the information from the latest update being the "2018 Statewide Vegetation Statistics" (Government of Western Australia 2019). The 2018 Statewide Vegetation Statistics are provided spatially by Data WA as "Pre_EuropeanVegetationDPIRD_006.shp" (Data WA 2021). From examination of the above shapefile, the Project area occurs within a single vegetation sub-association:

- Sub-association 585.1 Onslow Coastal Plain - Scrub or very open scrub / Grass-steppe.

Information on the current extent of the Vegetation Sub-association 585.1 is provided in Table 3 (Government of Western Australia 2019).

Table 3: Information on the extent of Vegetation Sub-associations 585.1

| Vegetation Association | Pre-European Extent (ha) | Current Extent (ha) | % Remaining | Current % in DBCA Managed Lands* | % of Vegetation Sub-association 585.1 within M08/272 |
|------------------------|--------------------------|---------------------|-------------|----------------------------------|--|
| 585.1 | 145,570.88 | 145,559.28 | 99.99 | 23.44 | 0.08 |

*% Current Extent Protected (IUCN I - IV) for Conservation (proportion of Pre-European Extent)

Sub-association 585.1 “Onslow Coastal Plain - Scrub or very open scrub / Grass-steppe” currently has 145,559.28ha or 99.99% of its pre-European area remaining (Government of Western Australia 2019). The vegetation within the NVCP application area is not considered to be a remnant of native vegetation in an area that has been extensively cleared. M08/272 contains approximately 0.08% of Vegetation Sub-association 585.1. Clearing of additional vegetation associated with Project expansion (~10ha) is unlikely to have any impact on the conservation status of Vegetation Sub-association 585.1.

2.10 CONSERVATION AREAS

From an examination of spatial data available from Data WA (2021):

- There are no Environmentally Sensitive Areas (‘ESA’s) within 68km of M08/272 (*ClearingRegulations_EnvironmentallySensitiveAreasDWER_046.shp*).
- M08/272 is contained within a Schedule 1 “Non-permitted area” pursuant to Schedule 1 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (*ClearingRegulations_EnvironmentallySensitiveAreasDWER_046.shp*). This Schedule 1 area is the Cane River Conservation Park (Reserve 46122).
- From the “data.wa” WMS Server there are no Threatened Ecological Communities (‘TEC’s) within 135km of M08/272 and no Priority Ecological Communities (‘PEC’s) within 43km (*Threatened Ecological Communities DBCA-038.shp*). The absence of TECs and PECs was also reported in the flora and vegetation survey reports.

2.11 EPBC ACT 1999

The *Environmental Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool was undertaken on a point in the middle of M08/27 (-31.2377S, 121.4701E) with a 20km buffer (DOEE 2021). The search results are provided in Appendix A.

In summary; there were no listings for:

- World Heritage Properties.
- National Heritage Places.
- Wetlands of International Importance.
- Wetlands of National Importance.
- Federally listed TECs.
- Federal TECs.
- Critical habitats.

Nine threatened species and 12 migratory species were listed. Of the threatened species, five are avifauna that are unlikely to have any specificity for the sandplain habitat at the Range Quarry, and have the mobility to rapidly retreat from quarrying activities:

- Curlew Sandpiper;
- Grey Falcon;
- Eastern Curlew;
- Night Parrot; and
- Australian Painted Snipe.

The other four threatened species are highly unlikely to inhabit the sandplain environment:

- Northern Quoll;
- Ghost Bat;
- Pilbara Leaf-nosed Bat; and
- Olive Python (Pilbara subspecies).

Likewise, the 12 listed migratory species are avifauna that are unlikely to inhabit the sandplain environment and have the mobility to rapidly retreat from quarrying activities.

Fauna are discussed further in Section 2.13.

2.12 FLORA AND VEGETATION

Three vegetation and flora surveys have been undertaken at the Range Quarry area:

- Jim's Seeds, Weeds and Trees (2004). Priority flora assessment for Onslow Mineral Exploration, of the proposed Range and Turtle Project ground disturbance area, September 2004);
- Botanica Consulting (2007). Flora and Vegetation Survey of the Turtle and Range Projects (M08/272 & M08/273. Botanica Consulting, June 2007 (Annex 1); and
- Newman Environmental (2011). Onslow Metals Turtle and Range Deposits Level 1 Flora Survey, Newman Environmental, June 2011 (Annex 2).

A targeted weed survey was also undertaken by in 2020:

- Spectrum Ecology (2020). M08/272 Targeted Weed Survey & Seed Mix Development. Spectrum Ecology, August 2020 (Annex 3).

2.12.1.1 Vegetation Surveys

The results of the Jim's Seeds, Weeds and Trees (2004) survey were included in the Botanica Consulting (2007) report. Botanica Consulting (2007) identified one vegetation group in the survey area; *Acacia* low open woodland over spinifex. The survey identified 20 families from 28 genera and 44 species. No conservation listed flora were recorded, nor any TECs or PECs.

Newman Environmental (2011) recorded a total of 17 families, 28 genera and 49 flora species at the survey area. No conservation listed flora were recorded.

M08/272 was described by Newman Environmental (2011) as being a single vegetation unit:

- Open *Corymbia* Woodland – Emergent *Corymbia zygophylla* and *Acacia ancistrocarpa*, *Acacia bivenosa* and *Acacia inaequilatera* sparse low open woodland over *Senna artemisioides* subsp. *oligophylla*, *Senna artemisioides* subsp. *helmsii* and *Acacia trachycarpa* mixed shrubs and *Aristida holathera* subsp. *holathera*, *Enneapogon caerulescens*, *Triodia wiseana*, *Triodia basedowii* and *Triodia lanigera* hummock grassland.

The vegetation map for M08/272 from Newman Environmental (2011) is provided as Figure 10 and a photograph of the Open *Corymbia* Woodland as Plate 5.

Newman Environmental (2011) reported that the survey area does not contain any PECs or TECs. This was confirmed using the Data WA WMS Server (Section 2.10).

Spectrum Ecology (2020) described a similar community albeit they were in specific areas for a weed survey and did not cover the entire lease:

- *Corymbia opaca* and *Corymbia zygophylla* low open woodland, over *Acacia ancistrocarpa* and *Acacia inaequilatera* low sparse shrubland, over *Triodia epactia* and *Triodia glabra* hummock grassland.

Spectrum Ecology (2020) reported *Triodia glabra* as a component of the hummock grassland. *Triodia glabra* was not described until 2017 and was previously confused with *Triodia lanigera* that is now recognised as occurring only in the Port Hedland area (Barrett *et al.* 2017). It is likely that Newman Environmental (2011) hummock grass description using *Triodia lanigera* is actually *Triodia glabra*.

The vegetation unit at M08/272 is part of the vast and expansive sand plains in the Ashburton coastal region and is considered widespread and common (Uaroo and Stuart Land Systems). The Uaroo and Stuart Land System cover 1,220,000ha and 302,400ha, respectively (Van Vreeswyk *et al.* 2004 and Payne *et al.* 1988).

2.12.1.2 Conservation Listed Flora

Based on all of the survey work undertaken to date, no Threatened Flora pursuant to the *Biodiversity Conservation Act 2016* or DBCA listed Priority flora species have been identified in the Range Quarry area. Furthermore, no plant taxa listed as Threatened pursuant to the *Environmental Protection and Biodiversity Conservation Act 1999* were located in the Range Quarry area (Jim's Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011 and Spectrum Ecology 2020).

An updated Naturemap search was undertaken for conservation listed flora in May 2021 centred on M08/272 (15° 25' 10" E, 22° 12' 21" S) with a 20km buffer. The search results and map are provided in Appendix B. Four Priority Flora were recorded in the 20km NatureMap search area, as listed in Table 4. No conservation listed flora have been recorded near M08/272 as per the NatureMap map, refer to Appendix B.

Table 4: Conservation listed flora species in the NatureMap search area (20km)

| Species | Code | Habitat |
|--|------|--|
| <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61) | P1 | Flat stony plain habitats, disturbed areas along roadside verges in the Onslow region (Chevron 2015). |
| <i>Eremophila forrestii</i> subsp. <i>viridis</i> | P3 | Red sandy soils and sand dunes (Chevron 2015). |
| <i>Euphorbia australis</i> var. <i>glabra</i> | P2 | On the bank of a large dry creek, red-brown loam, some pebbles, moderately-drained, red clay loam, extensive sub-saline flat (Atlas of Living Australia 2021). |
| <i>Helichrysum oligochaetum</i> | P1 | Red clay, alluvial plains (Western Australian Herbarium 2021). |

Abutilon sp. Onslow (P1) is considered unlikely to occur on the sand plains at M08/272 as it has a known habitat preference for stony ground.

Likewise, *Eremophila forrestii* subsp. *viridis* (P3) appears to prefer sand dunes, a landform not present in M08/272.

Euphorbia australis var. *glabra* (P2) is associated with creeks and drainage areas and so is not considered likely to occur in M08/272.

Helichrysum oligochaetum (P1) is typically found on red clay on alluvial plains across the Pilbara bioregion (Newman Environmental 2011, Western Australian Herbarium 2021). The closest recorded specimen has been found approximately 6.5km from the Project area on a disturbed area of red, clay soil with other *Asteraceae* sp. and *Cenchrus ciliaris*. This species was not recorded by Newman Environmental (2011) in the Project area.

As mentioned above, no conservation listed flora have been recorded at M08/272 in four flora surveys conducted between 2004 and 2020 (Jim's Seeds, Weeds and Trees 2004, Botanica Consulting 2007, Newman Environmental

2011 and Spectrum Ecology 2020). The proposed quarry expansion is there considered unlikely to have any impact whatsoever on conservation listed flora.

2.12.1.3 Introduced Flora

Two weed surveys have been conducted.

The first survey was completed in 2011 by Newman Environmental with two weed species being identified:

- Buffel Grass (*Cenchrus ciliaris*); and
- Purslane (*Portulaca oleracea*).

The second survey was completed in 2020 by Spectrum Ecology and focused on previously cleared or degraded areas where invasive species were more prevalent. Three introduced flora species recorded at M08/272:

- Kapok (*Aerva javanica*);
- Buffel Grass (*Cenchrus ciliaris*); and
- Birdwood Grass (*Cenchrus setiger*).

None of the above introduced species are 'Declared Pests' pursuant to Section 22 of the *Biosecurity and Agriculture Management Act 2007* as listed by the DPIRD (DPIRD 2021).

Of the three species, *Aerva javanica* was the most common and is the key weed species on site. This species was recorded in high density across all areas that have been previously cleared or disturbed, with 5,080 individuals recorded from 54 locations. *Cenchrus ciliaris* and *Cenchrus setiger* were less common, growing in scattered clumps across the site.

Portulaca oleracea is no longer considered as being introduced (native in part of its range, naturalised elsewhere).

Established weed populations are notoriously difficult to control and MCS has established a weed management program for the Site. This involves weed spraying and/or vehicle and topsoil hygiene in order to prevent the weeds spreading into the surrounding native vegetation, including along haul roads or around the periphery of the disturbed areas.

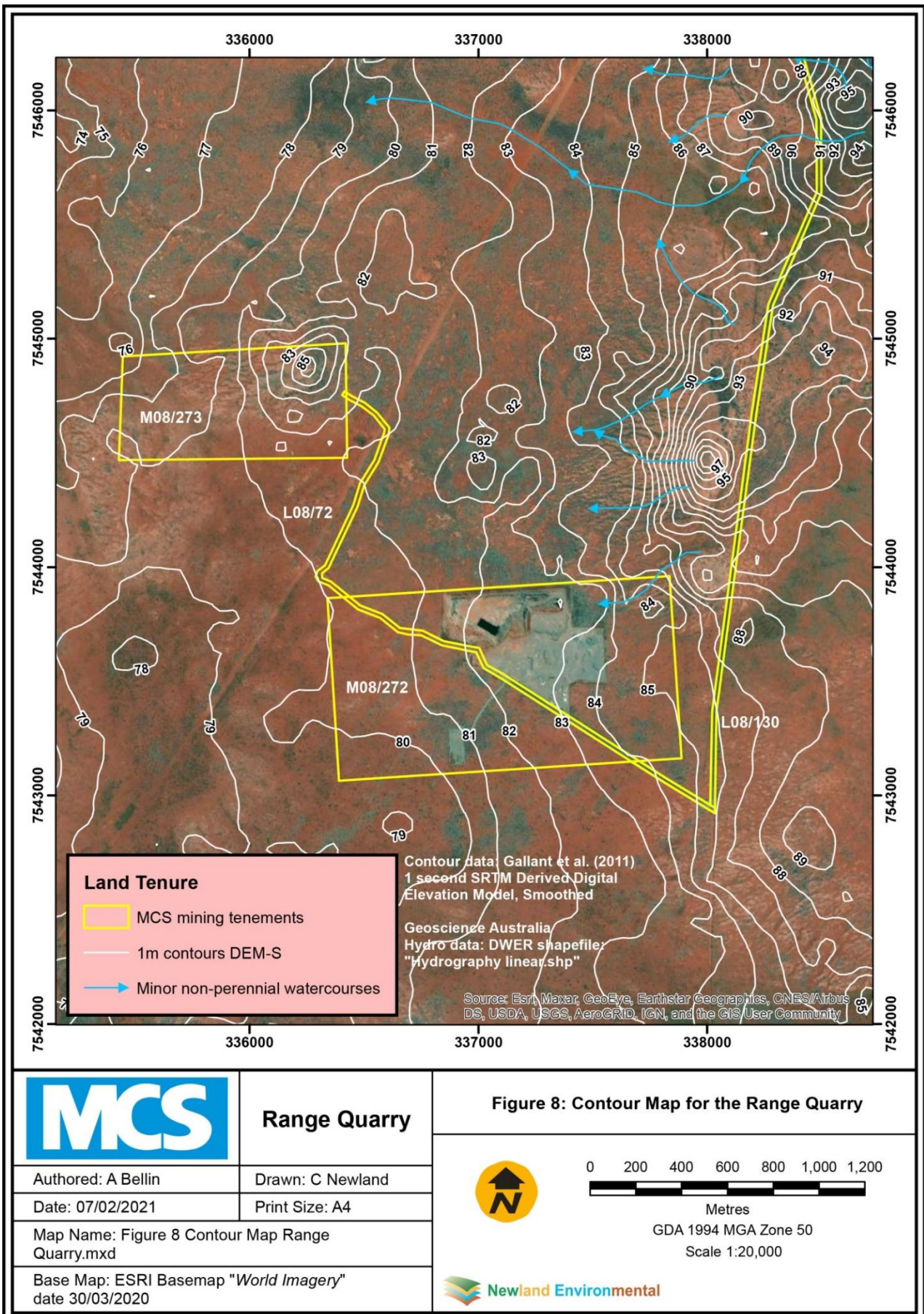


Figure 8: Contour Map for the Range Quarry

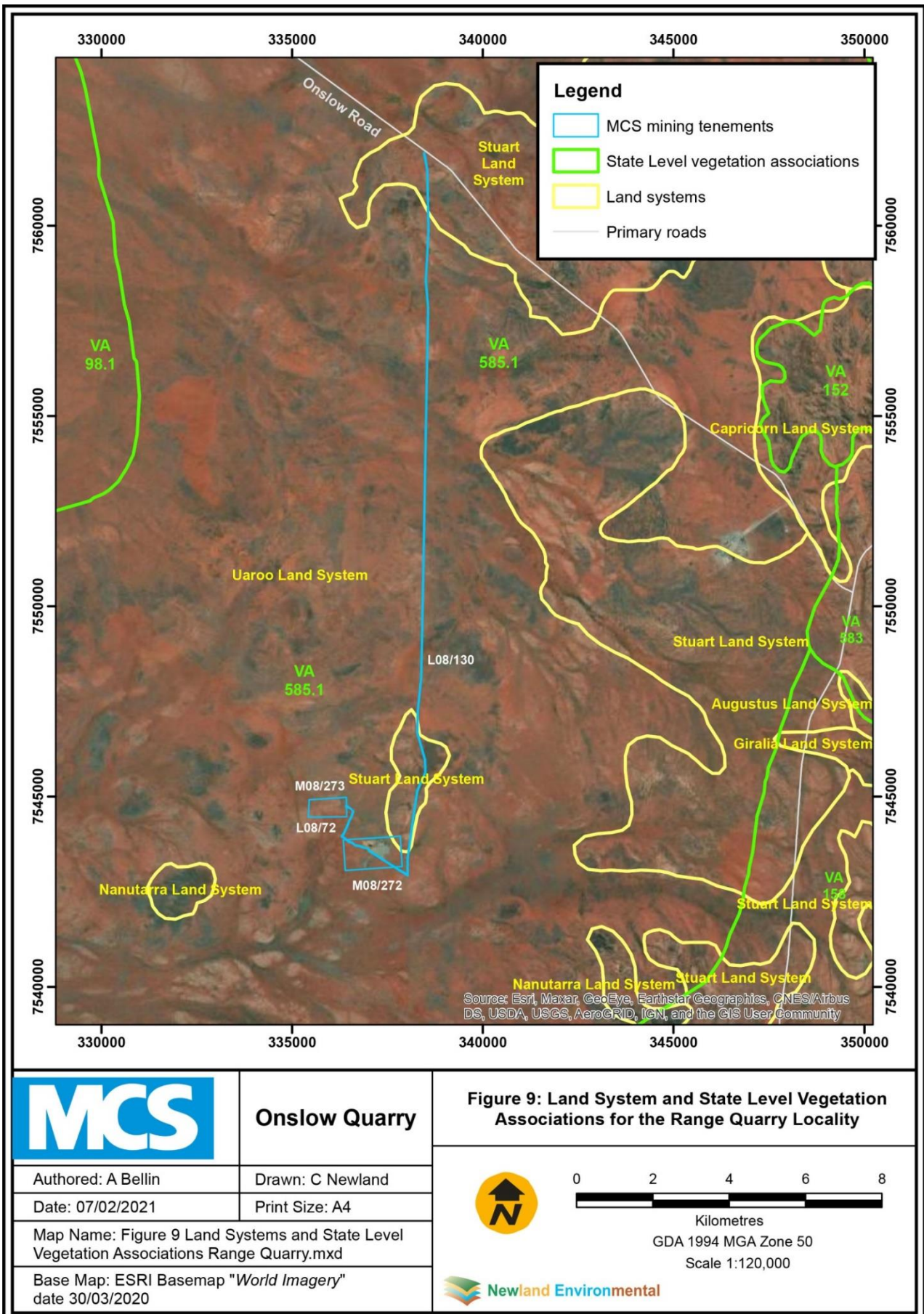


Figure 9: Land System and State Level Vegetation Associations for the Range Quarry Locality

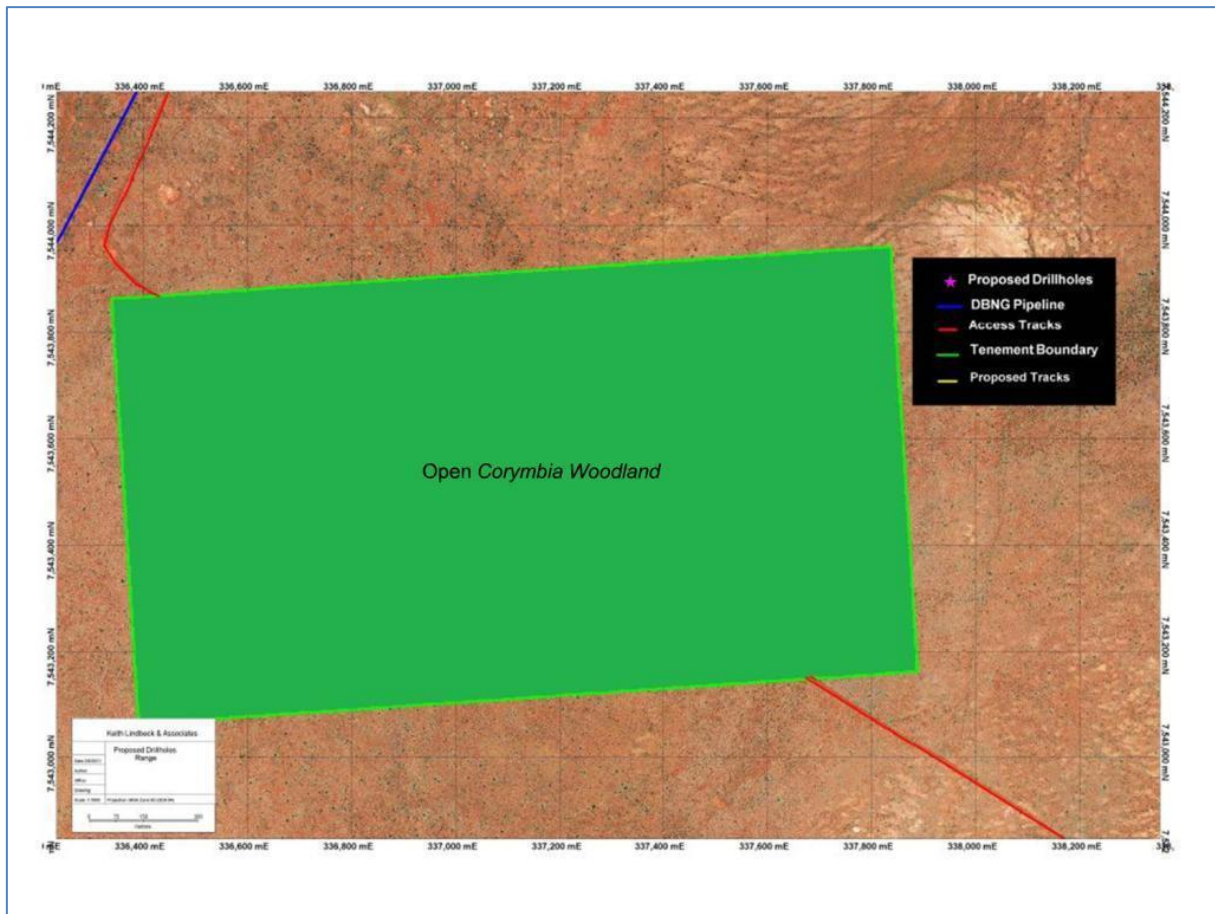


Figure 10: Vegetation Map of M08/272 from Newman Environmental (2011)



Plate 5: Open Corymbia woodland vegetation unit from Newman Environmental (2011)

2.13 TERRESTRIAL FAUNA

A Level 1 fauna survey of the Range Quarry area was undertaken by Egernia Environmental in June 2011 (Egernia Environmental 2011). A copy of the report is provided as Annex 4.

Habitats present were degraded in some areas from past exploration activities, particularly around the hill at Turtle and old mining shafts at Range. The main habitats for fauna comprised of spinifex-dominated lowlands with scattered shrubs and small trees to 3m.

The Range Quarry areas have the potential to support a wide range of vertebrate species including five amphibians, 112 reptiles, 106 birds and 34 mammal species. One reptile species, one non-native mammal species (*Felis catus*, Feral Cat) and eight bird species were recorded in the Range Quarry area during June 2011 survey (Egernia Environmental, 2011). No species of conservation or evidence of their presence were recorded during the reconnaissance survey (Egernia Environmental 2011).

Egernia Environmental surmised that the proposed disturbances will primarily impact lowland habitats with sparse vegetation cover. The lack of rocky upland habitats means that a suite of conservation listed species including the Northern Quoll, Olive Python and Ghost Bat are unlikely to occur due to no suitable denning habitat. However, an assemblage of species representative of lowland lightly wooded plains may occur, including the conservation listed fauna such as the Grey Falcon, Peregrine Falcon and Mulgara. The falcons are highly mobile and have the ability easily egress from any disturbance. The Mulgara or evidence of its occurrence was not recorded during the survey.

The Western Pebble-mound Mouse was formerly present in the Turtle areas on M08/273 but is now unlikely to occur. Only inactive mounds were recorded during the survey (Egernia Environmental 2011). No mounds were recorded in the NVCP application area (M08/272).

In general, given the small size of M08/272, lack of unique landforms within the lease area, previous exploration activities and representation of the habitat throughout the surrounding region, it is not considered that the proposed disturbances will have any major impact on fauna species present at the site.

The fauna of the region is generally well-studied (although not as well as other parts of the Pilbara), and comprehensive data sources including WA Museum collections, have allowed the expected occurrence lists to be compiled with a high degree of certainty.

An updated Naturemap search was undertaken for conservation listed fauna in May 2021 centred on M08/272 (15° 25' 10" E, 22° 12' 21"S) with a 20km buffer (NatureMap 2021). The search results are provided in Appendix C. Two Priority Fauna were recorded in the 20km NatureMap search area:

- *Falco hypoleucos* (Grey Falcon) - (Threatened); and
- *Pseudomys chapmani* (Western Pebble-mound Mouse) - (P4).

The Grey Falcon could overfly the area on foraging trips but is unlikely to use the site for any other purpose due to the lack of nesting or roosting trees. The highly mobile Grey Falcon has the ability to rapidly avoid and exit from any mining activities.

The Western Pebble-mound Mouse was found to no longer occur on site (Egernia Environmental 2011).

The Range Quarry expansion is therefore unlikely to have any impact whatsoever on conservation listed vertebrate fauna.

2.14 HERITAGE

The Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Enquiry System returned "No Registered Aboriginal Sites in Mining Tenement - M08/272" in a search conducted in May 2021 (DPLH 2021).

No archaeological or ethnographic sites of significance were recorded during the survey undertaken on M08/272 by Deep Woods Surveys in June 2007 (Deep Woods Surveys 2007).

An artefacts/scatter site, 'Area 51 No 1' (site ID: 26110), is located on L08/72 approximately 350m north from the boundary of M08/272. The artefacts/scatter site is located well outside of the proposed expansion area.

Onslow Metals Pty Ltd, the previous Quarry owner, entered into a native title agreement with the Thalanyji Aboriginal Corporation, the traditional landowners in the area and MCS will adopt the existing agreement.

MCS has commenced consultations with the Buurabalayji Thalanyji Aboriginal Corporation (Tim Grey – Smith Head of External Relations). As agreed by Tim Grey Smith, considering the proposed expansion area is covered by the June 2007 survey, no additional surveys are required (Grey-Smith 2021).

3 STATEMENT AGAINST EACH OF THE 10 CLEARING PRINCIPLES

3.1 PRINCIPLE A

Native vegetation should not be cleared if it comprises a high level of biological diversity

The NVCP application area occurs within the Roebourne (PIL4) Pilbara IBRA subregion of the (DOEE 2018a).

This subregion is characterised by quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *Acacia pyrifolia* and *Acacia inaequilatera* (Kendrick and Stanley 2001). Uplands are dominated by *Triodia* hummock grasslands (Kendrick and Stanley 2001). Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* spp. and mangal occur on marine alluvial flats and river deltas (Kendrick and Stanley 2001).

Three flora and vegetation surveys, and one targeted weed survey, have been conducted over the NVCP application area (Jim's Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011 and Spectrum Ecology 2020). The most comprehensive survey was conducted by Newman Environmental (2011) in May 2011 which covered all of M08/272. The survey identified 49 flora species from 28 genera and 17 families within the application area, therefore suggesting that floral diversity is not high (Onslow Metals 2012).

Based on all of the survey work undertaken to date, no Threatened Flora pursuant to the *Biodiversity Conservation Act 2016* or DBCA listed Priority flora species have been identified in the Range Quarry area (Jim's Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011 and Spectrum Ecology 2020). Furthermore, no plant taxa listed as Threatened pursuant to the *Environmental Protection and Biodiversity Conservation Act 1999* were located in the Range Quarry area.

The conservation listed flora map is provided in Appendix B. No conservation listed flora have been recorded near M08/272 as per the NatureMap map.

Two weed species, *Cenchrus ciliaris* and *Vachellia farnesiana*, were recorded by Newman Environmental (2011). Spectrum Ecology (2020) recorded *Aerva javanica* and *Cenchrus setiger* as well as *Cenchrus ciliaris* in their targeted weed survey of the quarry areas on M08/272.

Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires.

None of the above introduced species are 'Declared Pests' pursuant to Section 22 of the *Biosecurity and Agriculture Management Act 2007* as listed by the DPIRD. Potential impacts to biodiversity as a result of the proposed clearing will be minimised by the implementation of MCS's weed management plan.

A fauna survey of the NVCP application area was conducted in June 2011 by Egernia Environmental (2011). This survey identified one main fauna habitat, open spinifex shrubland with scattered *Acacia* and occasional *Eucalyptus* species, with little variation across the majority of the application area. No notable fauna habitats, such as wetlands or woodlands, were recorded within the NVCP application area (Egernia Environmental 2011).

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle A (flora, fauna or biological diversity).

3.2 PRINCIPLE B

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia

A fauna survey that included M08/272 was conducted by Egernia Environmental in 2011. No species of conservation or evidence of their presence were recorded during the survey (Egernia Environmental 2011).

This survey identified one main fauna habitat, open spinifex shrubland with scattered *Acacia* and occasional *Eucalyptus* species, with little variation across the majority of the application area. This habitat type is regional in extent. No notable or specialised fauna habitats were recorded (Egernia Environmental 2011).

Egernia Environmental surmised that the proposed disturbances will primarily impact lowland habitats with sparse vegetation cover. The lack of rocky upland habitats means that a suite of conservation listed species including the Northern Quoll, Olive Python and Ghost Bat are unlikely to occur due to no suitable denning habitat. However, an assemblage of species representative of lowland lightly wooded plains may occur, including the conservation listed

fauna such as the Grey Falcon, Peregrine Falcon and Mulgara. The falcons are highly mobile and have the ability easily egress from any disturbance. The Mulgara or evidence of its occurrence was not recorded during the survey.

The Western Pebble-mound Mouse was formerly present in the Turtle areas on M08/273 but is now unlikely to occur. Only inactive mounds were recorded during the survey (Egernia Environmental 2011). No mounds were recorded in the NVCP application area (M08/272).

In general, given the small size of M08/272, lack of unique landforms, previous exploration disturbances and representation of the habitat throughout the surrounding region, it is considered that the proposed disturbances in the NVCP application area will have no impact on conservation listed fauna or associated significant habitat.

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle B (significant fauna habitat).

3.3 PRINCIPLE C

Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora

Based on all of the survey work undertaken to date, no Threatened Flora pursuant to the *Biodiversity Conservation Act 2016* or DBCA listed Priority flora species have been identified in the Range Quarry area. Furthermore, no plant taxa listed as Threatened pursuant to the *Environmental Protection and Biodiversity Conservation Act 1999* were located in the Range Quarry area (Jim's Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011 and Spectrum Ecology 2020).

An updated Naturemap search was undertaken for conservation listed flora in May 2021 centred on M08/272 (15° 25' 10" E, 22° 12' 21"S) with a 20km buffer. The search results and map are provided in Appendix B. No conservation listed flora have been recorded near M08/272 as per the NatureMap map, refer to Appendix B. Four Priority Flora were recorded in the 20km NatureMap search area, as listed in Table 4. Each one is discussed in turn below.

Abutilon sp. Onslow (P1) is considered unlikely to occur on the sand plains at M08/272 as it has a known habitat preference for stony ground.

Likewise, *Eremophila forrestii* subsp. *viridis* (P3) appears to prefer sand dunes, a landform not present in M08/272.

Euphorbia australis var. *glabra* (P2) is associated with creeks and drainage areas and so is not considered likely to occur in M08/272.

Helichrysum oligochaetum (P1) is typically found on red clay on alluvial plains across the Pilbara bioregion (Newman Environmental 2011, Western Australian Herbarium 2021). The closest recorded specimen has been found approximately 6.5km from the Project area on a disturbed area of red, clay soil with other *Asteraceae* sp. and *Cenchrus ciliaris*. This species was not recorded by Newman Environmental (2011) in the Project area.

As mentioned above, no conservation listed flora have been recorded at M08/272 in four flora surveys conducted between 2004 and 2020 (Jim's Seeds, Weeds and Trees 2004, Botanica Consulting 2007, Newman Environmental 2011 and Spectrum Ecology 2020). The proposed quarry expansion is there considered unlikely to have any impact whatsoever on conservation listed flora.

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle C (existence of rare flora).

3.4 PRINCIPLE D

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community

PECs and TECs are discussed in Section 2.10. From the "data.wa" WMS Server, there no TEC's within 135km of M08/272 and no PEC's within 43km (*Threatened Ecological Communities DBCA-038.shp*). The absence of TECs and PECs was also reported in the flora and vegetation survey reports.

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle D (conservation areas).

3.5 PRINCIPLE E

Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared

The “Statewide Vegetation Statistics” are discussed in Section 2.9 and information on the one vegetation association occurring within the NVCP area is provided in Table 3 and displayed in Figure 9.

Sub-association 585.1 “Onslow Coastal Plain - Scrub or very open scrub / Grass-steppe” currently has 145,559.28ha or 99.99% of its pre-European area remaining (Government of Western Australia 2019). The vegetation within the NVCP application area is not considered to be a remnant of native vegetation in an area that has been extensively cleared. M08/272 contains approximately 0.08% of Vegetation Sub-association 585.1. Clearing of additional vegetation associated with Project expansion (~10ha) is unlikely to have any impact on the conservation status of Vegetation Sub-association 585.1.

Assessed Outcome: Based on the above, the proposed clearing is unlikely to be at variance with Principle E (remnant vegetation).

3.6 PRINCIPLE F

Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland

No wetlands were present in the DWER Clearing Permit System Map Viewer or reported in the flora surveys. The three flora and vegetation survey of the Range area did not identify any vegetation growing in association with watercourses or wetlands (Jim’s Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011). No wetlands are present in the Directory of Important Wetlands in Australia (DIWA) Spatial Database (DOEE 2018b).

From examination of aerial imagery (Google Earth, Landgate and ESRI World Imagery), there are no significant watercourses or wetlands in the Range Quarry locality. Several flow lines (without channels) are present as displayed in Figure 8.

Assessed Outcome:

Based on the above, the proposed clearing is not at variance with Principle F (watercourse or wetland).

3.7 PRINCIPLE G

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation

Land Systems are discussed in Section 2.8 and displayed in Figure 9. The Range Quarry area is located within the Uaroo and Stuart Land Systems. The following descriptions and areas are taken from Van Vreeswyk *et al.* (2004) and Payne *et al.* (1988).

- Uaroo Land System: This Land System is dominated by sandy plains with hard and soft spinifex grasslands. Broad, mostly unchannelled tracts up to 3km wide extend downslope from the low hills and stony rises into largely unchannelled creeklines This land system is generally not susceptible to erosion, however some erosion is present on drainage tracts (Van Vreeswyk *et al.* 2004). The total area from the Ashburton and Pilbara surveys combined is 1,220,000ha for the Uaroo Land System.
- Stuart Land System: Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands. Mainly erosional surfaces; minor hills, gently undulating stony plains and broad lower plains; moderately spaced tributary drainage tracts in upper parts becoming sparse and much broader downslope, may be channelled or unchannelled. This land system is generally resistant to erosion except for some lower plains and drainage tracts which are slightly to moderately susceptible

(Van Vreeswyk *et al.* 2004). The total area from the Ashburton and Pilbara surveys combined is 302,400ha for the Stuart Land System

Both the Stuart and Uaroo Land Systems are generally not susceptible to erosion, however both have some susceptibility to erosion within drainage tracts. There are no drainage tracts present within the NVCP application area.

Additionally, the Range Quarry is designed to contain any incident rainfall internally. Hence, runoff will not flow off site.

Therefore, the proposed clearing is unlikely to cause appreciable land degradation.

Assessed Outcome: Based on the above (and subject to environmental controls and progressive rehabilitation), the proposed clearing is not at variance with Principle G (appreciable land degradation).

3.8 PRINCIPLE H

Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area

The NVCP application area is located within the Cane River Conservation Park. Advice provided from DBCA (then the Department of Environment and Conservation) in 2012 recommended a number of measures relating to rehabilitation, mine closure and increased traffic through the Conservation Park.

MCS took over management of Range Quarry in January 2019, and following consultations with DMIRS, embarked on program of reviewing and rectifying outstanding environmental issues. As part of this program, MCS has developed and a conservation management plan and communication plan for operating within the Cane River Conservation Park that has been endorsed by DBCA. Mr David Pickle from DBCA met with MCS personnel on site on 24/03/2020 as part of the consultation process for the conservation management plan and communication plan.

Conservation values of the Cane River Conservation Park may also be adversely impacted by the spread of weed species as well as the actual physical mining disturbances.

The weed management process began with the study commissioned by MCS in 2020 whereby Spectrum Ecology visited site and conducted a targeted weed survey (Annex 3). In addition, MCS required details to assist in completing requirements of the MCP, including development of a seed mix list for future rehabilitation areas. Potential impacts to the conservation values of the Cane River Conservation Park as a result of the proposed clearing may be minimised by the implementation of the MCS weed management plan.

The physical impact on conservation value is considered to be primarily visual amenity as the quarry is unlikely to create any other significant land based environmental issues (such as pollution, contamination, erosion etc). One mitigating factor in regards to physical disturbance is that the area of disturbance is relatively small (currently 30ha and potentially 60ha at end of mine life) compared to the Cane River Conservation Park (147,868ha) and surrounding land acquired for inclusion as conservation estate (179,592ha). The impact on visual amenity from the quarry is relatively insignificant on an area comparison basis. Additionally, the location of the quarry is remote with no scenic values, and at mine closure, all disturbed areas, excepting the pit, will be rehabilitated with native vegetation to recreate the pre-existing environment.

Assessed Outcome: Based on the above, the proposed clearing is at variance with Principle H (conservation areas), albeit mitigated by weed management, end of mine life rehabilitation and the small size of the disturbance compared to the rest of the conservation estate.

3.9 PRINCIPLE I

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water

The three flora and vegetation survey of the NVCP application area did not identify any vegetation growing in association with watercourses or wetlands (Jim's Seeds, Weeds and Trees 2004, Botanical Consulting 2007, Newman Environmental 2011). It is therefore considered unlikely that the proposed clearing will impact on the quality of any surface water.

There are no PDWSAs near the Range Quarry. The closest PDWSA is the Cane River Water Reserve located approximately 48km to the north of M08/272 (DWER 2020). Given the distance separating the NVCP application area and the nearest water supply, the proposed clearing is not likely to impact on the quality of the Cane River Water Reserve.

The application area experiences an arid (semi-desert) tropical climate with highly variable rainfall, falling mainly in summer (Kendrick and Stanley 2001). With reference to DWER's Statewide groundwater salinity spatial data, the NVCP application area has low salinity levels of between 1,000 to 3,000 milligrams per litre Total Dissolved Solids (DWER 2020). It is considered unlikely that the proposed clearing of 30ha under this NVCP application within a semi-arid climate would cause local groundwater salinity levels to alter significantly.

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle I (surface and ground water).

3.10 PRINCIPLE J

Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding

The application area experiences an arid (semi-desert) tropical climate with an average annual rainfall of approximately 304.2mm (BOM 2021). This region is subject to cyclonic activity and sporadic thunderstorm events, during which local flooding is common. The NVCP application area is also located on sandplains with no significant watercourses that indicate runoff infiltration as against flooding.

It is considered unlikely that the proposed clearing of 30ha of native vegetation will cause or exacerbate the incidence or intensity of flooding in this region.

Assessed Outcome: Based on the above, the proposed clearing is not at variance with Principle J (flooding).

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5 APPENDIX A – EPBC ACT 1999 Search

Search Type: Point
 Coordinates: -22.20583 S, 115.41944 E
 Buffer: 20km buffer
 Date: 06/05/2021



Australian Government
 Department of Agriculture,
 Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 06/05/21 23:17:58

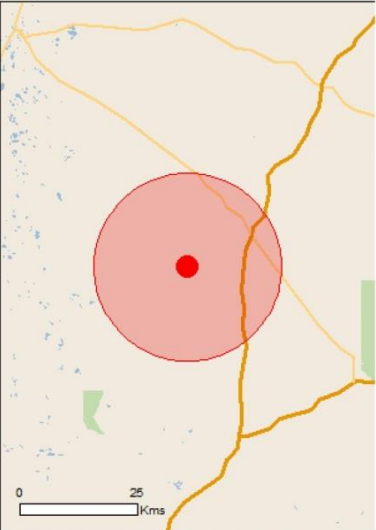
[Summary](#)

[Details](#)

- [Matters of NES](#)
- [Other Matters Protected by the EPBC Act](#)
- [Extra Information](#)

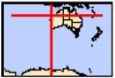
[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)
 Buffer: 20.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

| | |
|---|------|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 9 |
| Listed Migratory Species: | 12 |

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|--|------|
| Commonwealth Land: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 17 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

| | |
|--|------|
| State and Territory Reserves: | 2 |
| Regional Forest Agreements: | None |
| Invasive Species: | 9 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

Details

Matters of National Environmental Significance

Listed Threatened Species [Resource Information]

| Name | Status | Type of Presence |
|---|-----------------------|--|
| Birds | | |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Falco hypoleucos Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area |
| Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Pezoporus occidentalis Night Parrot [59350] | Endangered | Species or species habitat may occur within area |
| Rostratula australis Australian Painted Snipe [77037] | Endangered | Species or species habitat may occur within area |

Mammals

| | | |
|---|------------|--|
| Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331] | Endangered | Species or species habitat likely to occur within area |
| Macroderma gigas Ghost Bat [174] | Vulnerable | Species or species habitat likely to occur within area |
| Rhinonictes aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790] | Vulnerable | Species or species habitat may occur within area |

Reptiles

| | | |
|---|------------|--|
| Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699] | Vulnerable | Species or species habitat likely to occur within area |
|---|------------|--|

Listed Migratory Species

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|------------|--|
| Migratory Marine Birds | | |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |

Migratory Terrestrial Species

| Name | Threatened | Type of Presence |
|--|-----------------------|--|
| Hirundo rustica Barn Swallow [662] | | Species or species habitat may occur within area |
| Motacilla cinerea Grey Wagtail [642] | | Species or species habitat may occur within area |
| Motacilla flava Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Charadrius veredus Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area |
| Glareola maldivarum Oriental Pratincole [840] | | Species or species habitat may occur within area |
| Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Pandion haliaetus Osprey [952] | | Species or species habitat may occur within area |
| Other Matters Protected by the EPBC Act | | |
| Listed Marine Species | | [Resource Information] |
| * Species is listed under a different scientific name on the EPBC Act - Threatened Species list. | | |
| Name | Threatened | Type of Presence |
| Birds | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardea ibis Cattle Egret [59542] | | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |

| Name | Threatened | Type of Presence |
|---|-----------------------|--|
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Charadrius veredus Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area |
| Chrysococcyx osculans Black-eared Cuckoo [705] | | Species or species habitat likely to occur within area |
| Glareola maldivarum Oriental Pratincole [840] | | Species or species habitat may occur within area |
| Haliaeetus leucogaster White-bellied Sea-Eagle [943] | | Species or species habitat may occur within area |
| Hirundo rustica Barn Swallow [662] | | Species or species habitat may occur within area |
| Merops ornatus Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Motacilla cinerea Grey Wagtail [642] | | Species or species habitat may occur within area |
| Motacilla flava Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Pandion haliaetus Osprey [952] | | Species or species habitat may occur within area |
| Rostratula benghalensis (sensu lato) Painted Snipe [889] | Endangered* | Species or species habitat may occur within area |
| Extra Information | | |
| State and Territory Reserves | | [Resource Information] |
| Name | | State |
| Cane River | | WA |
| Cane River (Mount Minnie and Nanutarra) | | WA |

| Invasive Species | | [Resource Information] |
|---|--------|--|
| <p>Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.</p> | | |
| Name | Status | Type of Presence |
| Birds | | |
| Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803] | | Species or species habitat likely to occur within area |
| Mammals | | |
| Canis lupus familiaris Domestic Dog [82654] | | Species or species habitat likely to occur within area |
| Capra hircus Goat [2] | | Species or species habitat likely to occur within area |
| Equus asinus Donkey, Ass [4] | | Species or species habitat likely to occur within area |
| Felis catus Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Mus musculus House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Vulpes vulpes Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| Plants | | |
| Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213] | | Species or species habitat likely to occur within area |

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-22.20583 115.41944

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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 Department of Agriculture, Water and the Environment
 GPO Box 858
 Canberra City ACT 2601 Australia
 +61 2 6274 1111



6 APPENDIX B – NatureMap Search Conservation Listed Flora

Parameters: Plantae, Conservation Taxon (T, X, IA, S, P1-P5)

Search Type: Circle

Centre: 22° 12' 21" S, 115° 25' 10" E

Buffer: 20km buffer

Date: 03/05/2021



NatureMap Species Report

Created By Guest user on 03/05/2021

Kingdom Plantae
Conservation Status Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 25' 10" E, 22° 12' 21" S
Buffer 20km

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|--|-------------|-------------------|------------------------------------|
| 1. | 14110 <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61) | | P1 | |
| 2. | 17177 <i>Eremophila forrestii</i> subsp. <i>viridis</i> | | P3 | |
| 3. | 42843 <i>Euphorbia australis</i> var. <i>glabra</i> | | P2 | |
| 4. | 8030 <i>Helichrysum oligochaetum</i> | | P1 | |

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



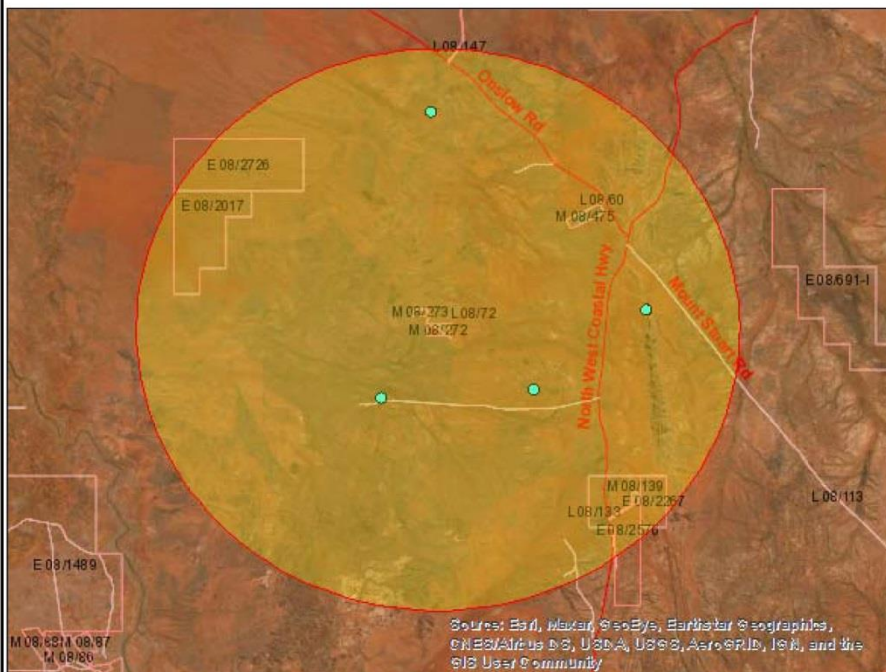
NatureMap

Mapping Western Australia's biodiversity

Conservation Flora 20km

Printed by Guest user on 3/5/2021

Query details : Kingdom=Plantae; Conservation Status=Conservation Taxon (T, X, IA, S, P1-P5); Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=115° 25' 10" E, 22° 12' 21" S; Buffer=20km;



Search Results

- Selected**
- Selected Species
- All Results**
- Default
 - Confirmed
 - Corrected
 - Reported

Reference Layers

- Major WA Towns
- Major WA Towns
- Major WA Towns
- Mining Tenements (live)
 - Live tenements
- Roads
 - Sealed
 - Unsealed
 - Other
- State Borders

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



Department of Biodiversity,
Conservation and Attractions



NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions, Western Australia, and the Western Australian Museum.

7 APPENDIX C – NatureMap Search Conservation Listed Fauna

Parameters: Animalia, Conservation Taxon (T, X, IA, S, P1-P5)

Search Type: Circle

Centre: 22° 12' 21" S, 115° 25' 10" E

Buffer: 20km buffer

Date: 03/05/2021



NatureMap Species Report

Created By Guest user on 03/05/2021

Kingdom Animalia
Conservation Status Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 25' 10" E, 22° 12' 21" S
Buffer 20km

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|--|-------------|-------------------|------------------------------------|
| 1. | 24473 <i>Falco hypoleucos</i> (Grey Falcon) | | T | |
| 2. | 24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadji) | | P4 | |

Conservation Codes
 T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under international agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



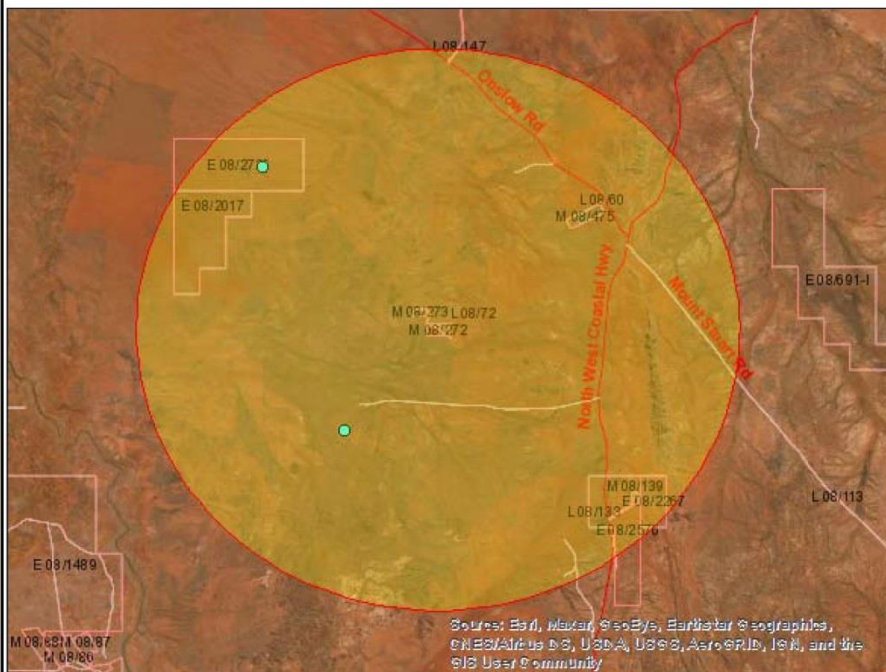
NatureMap

Mapping Western Australia's biodiversity

Conservation Fauna 20km

Printed by Guest user on 3/5/2021

Query details : Kingdom=Animalia; Conservation Status=Conservation Taxon (T, X, IA, S, P1-P5); Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=115° 25' 10" E, 22° 12' 21" S; Buffer=20km;



Search Results

- Selected**
- Selected Species
- All Results**
- Default
 - Confirmed
 - Corrected
 - Reported

Reference Layers

- Major WA Towns
- Major WA Towns
- Major WA Towns
- Mining Tenements (live)
 - Live tenements
- Roads
 - Sealed
 - Unsealed
 - Other
- State Borders

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



Department of Biodiversity, Conservation and Attractions



NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions, Western Australia, and the Western Australian Museum.



8 APPENDIX D – Aboriginal Heritage Inquiry System

Search Type: Registered Sites

Mining Tenement M80/272

Aboriginal Heritage Inquiry System

For further important information on using this information please see the Department of Planning, Lands and Heritage's Disclaimer statement at <https://www.dplh.wa.gov.au/about-this-website>

List of Registered Aboriginal Sites

Search Criteria

No Registered Aboriginal Sites in Mining Tenement - m 08/272

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at AboriginalHeritage@dplh.wa.gov.au and we will make every effort to rectify it as soon as possible.

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Coordinate Accuracy

Coordinates (Easting/Northing metres) are based on the GDA 94 Datum. Accuracy is shown as a code in brackets following the coordinates.



Aboriginal Heritage Inquiry System

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List of Registered Aboriginal Sites

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Aboriginal Heritage Inquiry System

Map of Registered Aboriginal Sites

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