PRELIMINARY DOCUMENTATION
EXPANSION OF LIMESTONE EXTRACTION
EPBC REF: 2022/09324

PREPARED FOR:

METEORSTONE
QUARRY and PROCESS NATURAL STONE

JUNE 2024

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EPBC REFERRAL 2022/09324
PRELIMINARY DOCUMENTATION

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Revision 1	Sue Brand	Kirsi Kauhanen	16 May 2024
Revision 2	Sue Brand	Kirsi Kauhanen	07 June 2024

EXECUTIVE SUMMARY

MBS Environmental (MBS) was engaged by Meteor Stone to assist with progressing State and Federal environmental approvals associated with the proposed clearing of 6.495 ha of Carnaby's Cockatoo (*Zanda latirostris*) foraging habitat from a portion of Mining Tenement M70/138 in Neerabup (Proposed Action Area, PAA, the Site). As the Carnaby's Cockatoo is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act, the Act), a referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) was made on 21 July 2022 advising of the proposed action and to determine the assessment method that would be applied to the project. Meteor Stone received notification on 7 October 2022 from DCCEEW advising that the proposed action was a 'controlled action' and the project would be assessed by preliminary documentation with further information.

The request for further information (RFI) issued under Section 95 A (2) of the Act was received on 27 October 2022 to assist with the assessment process. The RFI indicated that there was the potential for the following to be impacted by the proposed action in addition to the Carnaby's Cockatoo, so these matters of national environmental significance (MNES) are also considered within this document:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable).
- Baudin's Cockatoo (*Zanda baudinii*).
- *Melaleuca* sp. Wanneroo (Endangered).
- Yanchep Mallee (*Eucalyptus argutifolia*) (Vulnerable).

Various assessment activities carried out by PGV Environmental (2021) and GHD some years prior confirmed the vegetation present at the site was a woodland dominated by *Banksia sessilis* (Parrot Bush) and *Xanthorrhoea preissii* (Grasstree), with tall trees such Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*), and Tuart (*Eucalyptus gomphocephala*) absent due to the shallow soils over limestone being insufficient depth to accommodate their root systems, thus there are no trees within the Proposed Action Area that could be utilised by the Carnaby's Cockatoo for roosting and/or nesting. The *Banksia sessilis* (Parrot Bush) is a preferred foraging species of the Carnaby's Cockatoo rather than the Forest Red-tailed Black Cockatoo, with PGV Environmental recording feeding evidence on site during their survey activities. The Carnaby's Cockatoo was also observed by personnel from MBS Environmental and the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS), now the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS), and others during a visit to the Proposed Action Area in November 2022. On this basis, the loss of 6.495 ha of foraging habitat preferred by the Carnaby's Cockatoo is the focus of the Commonwealth environmental approvals process.

While the flora species present within the PAA include those preferred by the Forest Red-tailed Black Cockatoo, they are not the dominant species within the vegetation. Consultation with Dr Mike Bamford from Bamford Consulting Ecologists (2022) indicates that the Forest Red-tailed Black Cockatoo has been recorded north of Lake Joondalup in the Nowergup area where they were observed feeding on Marri, Jarrah, Pricklybark (*Eucalyptus todtiana*), and to a lesser degree, on Tuart. Accordingly, while this species could utilise the Site, it is unlikely to be present, with proposed management and mitigation measures implemented to mitigate against direct and indirect impacts to the Carnaby's Cockatoo also being effective against impacts to the Forest Red-tailed Black Cockatoo.

Bamford (*Pers. Comm.,* 2022) indicated that based on his experience, the Baudin's Cockatoo is unlikely to be utilising the Proposed Action Area as it is known from approximately 18 km to the east around Neaves Road Bullsbrook, 26 km to the southeast around Whiteman Park, and 38 km to the south around Perth Airport. Based on this information, the 14-year-old single record of the Baudin's Cockatoo listed on the Department of Biodiversity, Conservation and Attractions (DBCA) (2022f) threatened and priority listed fauna database search approximately 9 km to the south may be a misidentification due to the similarity of this species with the Carnaby's Cockatoo or a data entry issue at the time of reporting cannot be ruled out.

While the *Melaleuca* sp. Wanneroo and the Yanchep Mallee (*Eucalyptus argutifolia*) have been recorded within 200 m of the Proposed Action Area, they have not been observed within the Site, and are unlikely to be directly or indirectly impacted by the Proposed Action.

As the key impact to Carnaby's Cockatoo's is the loss of 6.495 ha of Carnaby's Cockatoo foraging habitat, a residual impact is likely and an offset is proposed. The proposed offset will be the purchase of a [redacted] approximately 85 km north of the Proposed Action Area. The preliminary due diligence visit in December 2023 to the [redacted] site confirmed utilisation by the Carnaby's Cockatoo through observation by MBS personnel of feeding debris on Banksia cones, with others that have visited the site confirming they have noted their presence at other times. Utilisation of the [redacted] Site was confirmed during a Carnaby's Cockatoo habitat assessment carried out by Dr Mike Bamford from in March 2024 (Bamford Consulting Ecologists, 2024).

The RFI also requested information relating to:

- Ecologically sustainable development.
- The environmental record of the Proponent.
- Other approvals and conditions.
- Economic and social matters.
- Reference within the document of various standards, policies, and guidelines.

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APPENDICES

1. INTRODUCTION

Meteor Stone Pty Ltd are planning to clear 6.495 ha of native vegetation to support an expansion of limestone extraction activities within a portion of Mining Tenement M70/138 (the Site, Proposed Action Area, PAA) known as Sublease 5 (Figure 1). As the vegetation on the Site includes species that are preferred foraging habitat for the Carnaby's Cockatoo (*Zanda latirostris*), which is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act, the Act), a referral was submitted to the Department of Climate Change, Energy, the Environment, and Water (DCCEEW) on 03 August 2022.

The referral decision received on 10 October 2022 indicated that the proposed clearing was a 'controlled action' as defined by the Act with the assessment approach being preliminary documentation with further information being required. The request for further information (RFI) issued under Section 95 A (2) of the Act was received on 27 October 2022 to assist with the assessment process. The RFI indicated that there was the potential for the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable), the Baudin's Cockatoo (*Zanda baudinii*), the *Melaleuca* sp. Wanneroo (Endangered), and the Yanchep Mallee (*Eucalyptus argutifolia*) (Vulnerable) to be impacted by the proposed action in addition to the Carnaby's Cockatoo, so these matters of national environmental significance (MNES) will also be considered within this document.

This document (preliminary documentation, PD) has been prepared by MBS Environmental (MBS) to provide the requested information. The format of this document follows that of the RFI document, with each section addressing a section of the RFI and its associated components in the order they were presented. Each section includes a summary of the information required by DCCEEW as an introductory paragraph.

381,500 382,200 382,900 383,600 384,300

6,498,800

6,498,100

6,497,400

N

Wesco Road

Hopkins Road

Sublease 1
Meteor Stone

Sublease 2

Sublease 3

Mining Tenement M70/138

Meteor Stone
Limestone
Processing

Lot 6

Proposed
Action
Area

Lot 7

Legend

Proposed Action Area (6.495 ha)

M70 138 Boundary (approx. 97 ha)

Scale: 1: 8,000
Original Size: A3
Imagery source: NearMap July 2023, MPP0.597
Grid: GDA94 / MGA zone 50 (EPSG:28350)

0 0.25 0.5 km

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 1

M70/138 and Proposed Action Area (Sublease 5) Location

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\\mbssvr\working\Meteor Stone\GIS\Wesco Road Sublease 5.qgz 30/03/2024 F1 Location

2. DESCRIPTION OF THE ACTION

The description of the action outlines what will occur on the land to be cleared, in this case, the extraction of limestone blocks over a 10 – 20-year period. Meteor Stone's response to this section of the RFI is provided in this section.

2.1 PROPOSED ACTION COMPONENTS

The proposed action is the clearing of 6.495 ha of floristic community type (FCT) 24 Northern Spearwood Shrublands that has value as foraging habitat for the Endangered Carnaby's Cockatoo (*Zanda latirostris*), to facilitate the extraction of limestone. Thus, an overview of the proposed action components is provided, with additional information provided in Section 2.6.2 on pp 11 – 14 of the Mine Closure Plan prepared by Landform Research (2020) that was provided as Attachment 1 to the referral document.

2.1.1 Pre-operational Activities

Pre-operation activities will commence within one month of the approval being issued and will be completed within four weeks. The following pre-operational activities will occur (Figure 2):

- Site preparation in the form of the mechanical clearing of 6.495 ha of native vegetation, either by bulldozer for larger material or track crusher for smaller material. Vegetative material will be stored and used for batter slope stabilisation or for rehabilitation of sites where extraction has been completed.
- Topsoil will be pushed to the edge of the disturbance area and formed into low storage dumps up to 5 m depending on the surrounding landform; for later use in the rehabilitation process due to the seed and microbial material present that will assist with rehabilitation success. In the short term, the presence of the storage dumps will act as visual and noise barriers.
- Removal of overburden in the form of sand and surface limestone rubble to gain access to the resource; this material is pushed into bunds from which it can be respread at the conclusion of extraction when the final land surface is being reconstructed.
- There will be no infrastructure or buildings within the quarry area, with mobile equipment that is moved according to the layer being extracted, with depth of the pit reducing by the height of the dimension stone being extracted.

2.1.2 Operation — Excavation of Limestone

Operational activities will commence after the completion of site clearing and preparation and are expected to last for a minimum of 10 years and up to 20 years. The following activities will occur during the operational phase (Figure 2):

- Excavation of dimension stone (large limestone blocks) that are used for the construction of masonry noise walls, for example. The extraction will occur progressively across the Site, with each layer of limestone being removed before the next layer is commenced.
- Loading of the product (dimension stone) onto semi-trailers for transport to client sites as no processing is required.
- The operation is a no-waste operation, and if there is any limestone that is not of a suitable quality for the creation of dimension stone, it will be processed at the Meteor Stone processing area located at Lot 6 Wesco Road Nowergup, where it can be crushed for use as road base or to create reconstituted limestone blocks; this may be a later activity once the extraction of the dimension stone is complete.
- Any waste products associated with the operation will be reused or recycled where possible or disposed of to an appropriate landfill or other waste management location as appropriate.

- Approximately 1 – 2 years prior to the completion of extraction activities, a rehabilitation management plan will be prepared that is consistent with the information included in the MCP prepared by Landform Research (Refer MCP Landform Research Oct 2020 Sections 8.3 (p 89), 9.3 (p 96), 9.4 (p 97), 9.5 (p 100), and Section 10 (p105) provided as Attachment 1 to the referral, or later versions of the MCP as appropriate, and PGV Env 2021 Flora, Veg and Black Cockatoo Assessment provided as Attachment 4 to the referral). The document will be prepared and submitted to DCCEEW (or its successor) for approval prior to the conclusion of extraction activities given the expected life of the quarry and consider the conditions at that time as well as adopting available best practice rehabilitation measures, as well as allowing a suitable lead time for plant stock to be obtained in advance of implementation.

2.1.3 Post Extraction (Decommissioning)

Post extraction will commence at the conclusion of the 10 – 20-year extraction period and continue for approximately 3 years post closure or until completion criteria are met. Post extraction activities will include (Figure 2):

- At the conclusion of extraction activities, plant and equipment will be removed from the quarry floor.
- The quarry floor will then be deep ripped, covered by a layer of overburden, and then topsoil returned where appropriate.
- Rehabilitation of the Site with native species consistent with the pre-clearing condition.

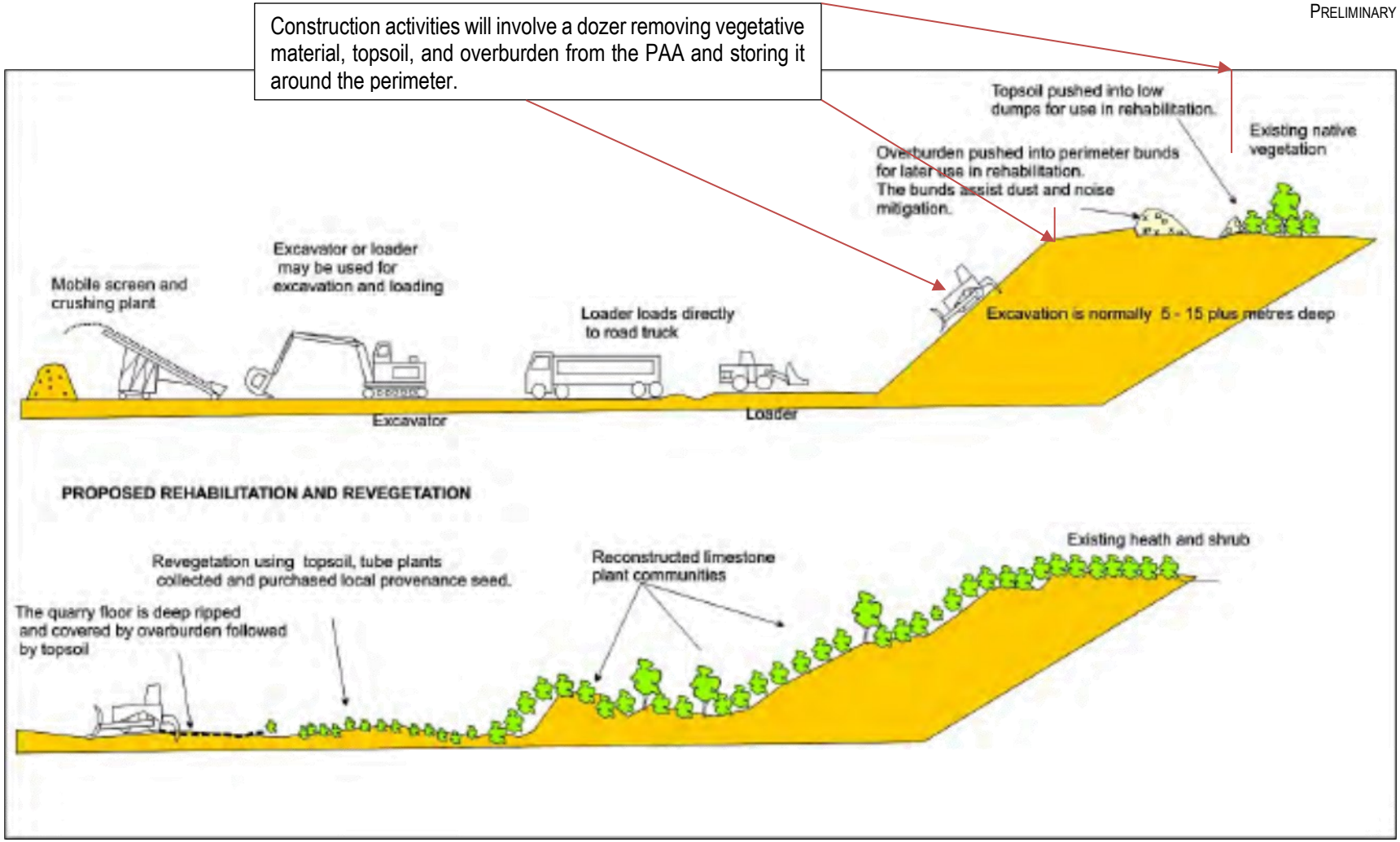

Figure 2: Overview of the Proposed Action

Source: Landform Research, 2020, p 17

2.2 PROPOSED ACTION LOCATION AND TENURE

M70/138 is located at Lot 12737 on Deposited Plan 193226 at 210 Wesco Road, Nowergup, within the City of Wanneroo. Lot 12737 is a Reserve for the purpose of quarrying vested with the State of Western Australia. The proposed clearing will occur in a 6.495 ha portion of mining tenement M70/138 on what will be known as Sublease 5 (Figures 1, 3) that will be operated by Meteor Stone to enable the continued extraction of limestone from a location close to their current operations under a Sublease arrange from Adelaide Brighton Pty Ltd trading as Cockburn Cement, the tenement holder.

The entire 6.495 ha will be cleared (the Proposed Action Area, PAA), with waste materials in the form of overburden and plant materials being stored around the perimeter of the disturbance area, where it will act as a visual and physical barrier between vegetation retained beyond the PAA.

2.3 DIRECT AND INDIRECT IMPACTS

The Proposed Action will result in direct and potentially indirect impacts to the surrounding environment. These are identified in this section with the Draft Construction Environmental Management Plan included as Appendix 1 providing the information as to how each will be managed.

2.3.1 Direct Impacts

The 6.495-ha clearing footprint comprises the proposed resource extraction area of 5.587 ha and an access track to take the product from the extraction location to client sites (dimension blocks) or to the processing site in Lot 6 to the west, depending on the grade of limestone extracted. The Proposed Action Area represents the direct impact area and has the same dimensions and location as the Site boundary (6.495 ha; Figure 3). Direct impacts will revolve around the clearing of 6.495 ha of foraging habitat used by Carnaby's Cockatoo (*Zanda latirostris*), for the duration of operations followed by the post-operational rehabilitation phase. The area to be cleared represents approximately 43.3% of the vegetation that will be removed from within the overall Sublease 5 site.

2.3.2 Indirect Impacts

While indirect impacts are not expected as the location of the Proposed Action Area within an active mining tenement means that all activities and impacts will be confined to the Sublease 5 boundary. However, those that may occur include:

- Dust.
- Noise.
- Weeds and plant pathogens.

2.3.3 No Impacts

There will be no impacts to:

- Groundwater, as the extraction will occur above the watertable.
- Surface water, as no surface water features are present within the Proposed Action Area.
- Neighbours or other sensitive land uses as there are none within 1 km of the Proposed Action Area.
- The Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), as this species has not been recorded within the Nowergup area (Bamford *Pers. Comm.*, 2022).
- The Baudin's Cockatoo (*Zanda baudinii*) as this species is known from the east and south of the Perth metropolitan area (DAWE, 2022; Bamford *Pers. Comm.*, 2022).

- The *Eucalyptus argutifolia* or the *Melaleuca* sp. Wanneroo, as these species are not recorded within 200 m of the PAA.

2.4 LOCATION RATIONALE

The limestone resource within M70/138 is Tamala Limestone which is associated with the Spearwood Sands along the coastal strip (Davidson, 1995). These sands have a marine origin, being deposited within the Quaternary period, with the action of rainwater on shell fragments present dissolving the calcium carbonate then depositing and consolidating it within the soil profile in the form of limestone (Powell, 1990; Davidson, 1995). The Karrakatta sands present within the tenement boundary and the surrounding area are associated with the limestone being close to or outcropping at the surface.

Limestone extraction has occurred within the M70/138 boundary and locations within the Neerabup locale for more than 90 years (Heritage Council, 2017a, b), with early extraction areas that supplied limestone for lime production being expanded on by Meteor Stone in the Sublease 1 area in later years (Randazzo, 2024).

The Sublease 5 area is approximately 15 ha, of which the clearing of 6.495 ha is proposed to access the limestone resource present at the site, with no previous extraction activities occurring in this location. The proposed 6.495-ha extraction site (proposed action area) represents the location with the best limestone resource present within the Sublease 5 area (Figure 3). At this location the limestone is nearer to the surface and so represents the most efficient area for extraction with less overlying sand ('waste' material) along with a superior grade of limestone likely (Landform Research, 2022b).

As an active mining tenement, M70/138 is associated with the presence of the limestone resource, and the vegetation community present within the tenement boundary reflects the limestone presence and shallow sands that do not support the root systems of taller trees such as Jarrah and Marri (Figures 3, 5). Accordingly, there is no alternative location where extraction can occur that will not impact the Carnaby's Cockatoo foraging habitat.

Information relating to the availability of limestone was calculated in 2016 for the Sand and Limestone Association of WA and reassessed in 2022 (Landform Research, 2022a) (Appendix 2). This information indicates a demand of around 2 Mt per annum, with resources increasingly affected by reduced availability within the Perth metropolitan area associated with the setting aside several locations for conservation purposes. In turn, this results in higher transportation costs that flow-on to the community in the form of increased cost of construction and greenhouse gas emissions due to the need to transport construction materials, including limestone, 100 km or more from their source to where they are needed.

382,600 382,800 383,000 383,200 383,400

6,498,200 6,498,000 6,497,800 6,497,600

Mining Tenement M70/138

Proposed Action Area

Lot 7

Legend
- Proposed Clearing Area (6.495 ha)
- 2 m Contours DPIRD 072 (extract)

Scale: 1: 3,000
Original Size: A3
Esri Aerial Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 0.25 0.5 km

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 3

Location Rationale
Proposed Action Area

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3. DESCRIPTION OF THE ENVIRONMENT

The description of the environment provides the context for the flora, vegetation, and associated fauna that comprise the various ecological communities present within an area. The features that comprise the physical characteristics of the proposed clearing area (the PAA) and its surrounds are provided in this section.

3.1 BIOPHYSICAL SITE CHARACTERISTICS

The existing environment of the Proposed Action Area is described based on a desktop review of available resources, flora, and fauna survey reports (PGV Environmental 2021, GHD 2014, provided as Attachment 4 and Attachment 5 to the original referral), and a visit to the site on 09 November 2022. Where the desktop review used GIS data layers available via DataWA, they are referenced using their identifier, e.g. DWER-031 (DWER, 2018f), along with the agency responsible for the material and the date the layer was last updated.

3.1.1 Bioregional Context

The Proposed Action Area is located within the Swan Coastal Plain Bioregion classified by the Interim Biogeographic Regionalisation for Australia (IBRA) and is described as a low lying coastal plain, mainly covered by Banksia or Tuart woodlands over sandy soils with paperbark prevalent in swampy areas (Thackway and Cresswell, 1995).

The Swan Coastal Plain Bioregion is divided into two subregions, the Dandaragan Plateau (SWA01) and Perth (SWA02), of which the Proposed Action Area is located within the Perth subregion. This subregion is comprised of colluvial and aeolian sands, alluvial river flats and coastal limestone. Native vegetation varies from Heath and/or Tuart woodlands on limestone, Banksia, and Jarrah woodlands on Quaternary marine dunes of various ages, and Marri on colluvial and alluvials. This subregion also includes a complex series of seasonal wetlands (Mitchell, Williams, and Desmond 2002). The primary land use associated with this subregion includes dry land agriculture, conservation, and crown reserve, as well as urban and rural residence (Mitchell, Williams, and Desmond 2002).

3.1.2 Climate

The Proposed Action Area experiences a Mediterranean climate characterised by hot, dry summers and cool, wet winters. The closest Bureau of Meteorology (BoM) weather station is the Gingin Aero (station ID 009178) located approximately 21.3 km to the north, with average statistics recorded between 1996 and 2022 (BoM, 2022) including:

- Average monthly maximum temperatures range from 17.1°C to 33.2°C, with the highest recorded maximum being 44.5°C and the lowest 25.8°C.
- Average monthly minimum temperatures range from 6.5°C to 17.1°C, with the highest average minimum being 6.6°C and the lowest -3.7°C.
- Average annual rainfall is 620.7 mm, with the majority falling between May and September.
- Average wind speeds range from 16.9 to 25.9 km/h, with gusts to 100 km/h or more possible during storm events.
- Morning (9 am) winds range from easterlies during warmer months, changing to northerlies or northeasterlies during cooler months.
- Winds range from southeasterlies in the morning, changing to westerlies in the afternoon.

3.1.3 Landform and Topography

The Department of Primary Industries and Regional Development (DPIRD) dataset Soil Landscape Mapping — Systems (DPIRD-064)(DPIRD, 2022a) indicates that the Proposed Action Area is wholly contained within the Spearwood System of the Swan Coastal Plain, which is characterised by sand dunes and plains with deposits of aeolian sand and limestone over sedimentary rocks. The *2-m Contours* dataset (DPIRD-072) (DPIRD, 2019a)

indicates that the Sublease 5 extraction area rises from 86 m Australian Height Datum (AHD) from the west to a dune ridge at 98 m AHD, decreasing from that ridge to the east to 88 m AHD (Figures 5 and 4).

3.1.4 Soils

According to *Soil Landscape Mapping — Best Available* layer, DPIRD-027 (DPIRD, 2022b), two soil types associated with the Spearwood Dune System are present within the Proposed Action Area (Table 1, Figure 4). The proposed extraction area and most of the access track (approximately 6.33 ha) are located within the Karrakatta Shallow Soils Phase (211Sp_Kls), which is representative of the shallow soils located over the limestone resource (Tamala limestone) that will be extracted (Figure 5). The western remainder of the access track (approximately 0.16 ha) is located in the Karrakatta Sand Yellow Phase (211Sp_Ky) (Table 1, Figure 4). The nature of the site geology along with the absence of wetlands and waterways mean there are no known acid sulfate soils (ASS) within the site boundary, and none are likely as the limestone extraction will occur above the watertable.

382,600 382,800 383,000 383,200

6,498,000 6,497,800

Mining Tenement M70/138

Proposed Action Area

N

Legend

Soils

- 211Sp__Kls (Approx. 6.33 ha)
- 211Sp__Ky (Approx. 0.16 ha)
- 2 m Contours DPIRD 072 (extract)
- Proposed Action Area (6.495 ha)
- M70 138 Boundary

Scale: 1: 2,200
Original Size: A3
Imagery Source: NearMap October 2023 MPP0.597
Grid: GDA94 / MGA zone 50 (EPSG:28350)

0 100 200 m

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 4

Soils and Topography

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Figure 5: Karrakatta Soils Shallow Phase (211Sp-Kls)

Table 1: Soil Types

Symbol	Name	Description
211Sp__Kls	Karrakatta Shallow Soils Phase	Low hills and ridges, with bare limestone or shallow siliceous or calcareous sand over limestone. Associated vegetation is typically dense shrubs with scattered emergent Tuart (*Eucalyptus gomphocephala*) and Jarrah (*Eucalyptus marginata*).
211Sp__Ky	Karrakatta Sand Yellow Phase	Low hilly to gently undulating terrain. Yellow sand over limestone at 1 – 2 m. Associated vegetation is typically dense low shrubs dominated by *Banksia sessilis*, *Melaleuca huegelii* and species of *Grevillea.*

The entire Lot 12737, including the Proposed Action Area, is in an area mapped as a regionally significant basic raw material (limestone) resource (DMIRS-050) (Department of Mines, Industry Regulation and Safety (DMIRS), 2019).

3.1.5 Groundwater

The Proposed Action Area lies within the Wanneroo Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DWER-034). The unconfined 'Perth — Superficial Swan' aquifer overlies the more confined 'Perth-Leederville' aquifer and 'Yarragadee North' aquifer (Department of Water and Environmental Regulation (DWER), 2022). According to DWER (2022), the depth to groundwater is approximately 22 – 28 mAHD, or 50 – 70 m below the natural surface level, and generally flows to the west towards the ocean.

3.1.6 Surface water

The Proposed Action Area lies across both the Wanneroo Coastal Lake and Swan Avon Lower Swan catchments, of the Swan Coastal Basin (8 465 km^2) of the South West Division (DWER-027, (DWER, 2018d); DWER-028, (DWER 2018b); DWER-029, (DWER, 2018c); and DWER-030 (DWER, 2018d)). No surface water areas proclaimed under the RIWI Act occur within the Site (DWER-037) (DWER, 2018e).

There are no permanent or ephemeral water bodies such as wetlands, rivers, creeks, or drainage lines within the Proposed Action Area or property boundary (DWER-031 (DWER, 2018f); DBCA-019 (DBCA, 2022a); DBCA-010 (DBCA, 2017); and DBCA-045 (DBCA, 2022b)). The closest wetland is Camel Swamp, a Dampland (seasonal basin), located approximately 680 m to the northeast of the Proposed Action Area, with other wetlands and/or waterways more than 2.5 km to the east, west, or south (DBCA-019) (DBCA, 2022a).

No Public Drinking Water Source Areas (PDWSAs) are located within the Proposed Action Area or property boundary, with the closest being the Gnangara Underground Water Pollution Control Area, approximately 1.95 km to the east (DWER-033) (DWER, 2022).

3.1.7 Vegetation

3.1.7.1 Vegetation Complex

Vegetation complexes are broad-scale descriptions of vegetation based on rainfall and the underlying geomorphology of a location, as assessed by Heddle, Loneragan, and Havel (1980). A review of the Vegetation Complex dataset (DBCA-046) (DBCA, 2018), the Proposed Action Area is located entirely within the *Cottesloe – Central and South Vegetation Complex* (Figure 6), which comprises a mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *E. gomphocephala – E. marginata* (Jarrah) – *Corymbia calophylla* (Marri), and closed heath on the limestone outcrops' (Heddle et al., 1980). The Proposed Action Area is located on shallow soils over limestone where a closed heath is the vegetative form rather than a forest or woodland with taller trees (Figure 5). Taller trees such as Eucalypts and Marri are present in areas of deeper soils, outside the proposed clearing boundary.

3.1.7.2 Vegetation Association

An alternative method of categorising the vegetation present within a location is by vegetation association, with mapping originally carried out by Beard at the 1:250,000 scale providing the main data source for determining the association likely to have existed prior to European settlement , and which is reflected in the DPIRD-006 dataset (DPIRD, 2019b). A review of that dataset indicates the Proposed Action Area is located within Vegetation Association 949 that is described as Low woodland, Banksia (DPIRD, 2019), with its boundary consistent with the Heddle et al. (1980) vegetation complex mapping so is not shown separately. A summary of the pre-European extent of this vegetation association, its current extent, and the extent within the City of Wanneroo is provided in Table 2 (DBCA, 2019c).

Table 2: Vegetation Association Data

Vegetation Association	949
Description	Low woodland, Banksia
Pre-European Extent (ha)	218,193.94
Current Extent (ha)	123,104.02
% Remaining	56.42
Pre-European Extent — City of Wanneroo (ha)	37,138.40
Current Extent — City of Wanneroo (ha)	17,196.34
% Remaining — City of Wanneroo	46.30
Proposed Area to be Cleared (ha)	6.495
% Current Extent (ha)	0.005
% Current Extent — City of Wanneroo (ha)	0.038
% Protected (Reserved for Conservation) Pre-European Extent (ha)	14.05
% Protected (Reserved for Conservation) Pre-European Extent — City of Wanneroo (ha)	8.72
% Protected (Reserved for Conservation) Current Extent (ha)	24.47
% Protected (Reserved for Conservation) Current Extent — City of Wanneroo (ha)	18.47

3.1.7.3 Vegetation Type

An assessment of the vegetation type at a site represents a finer-scale assessment (mapping) of dominant over, middle and understorey species within an area of interest. The Sublease 5 area, including the Proposed Action Area, was assessed by PGV Environmental (2021), with a single vegetation type recorded (Table 3).

Table 3: Vegetation Type

Vegetation Type	*Banksia sessilis/Hakea trifurcata/Xanthorrhoea preissii* Tall Open Scrub over *Hibbertia hypericoides/ Calothamnus quadrifidus/ Acacia pulchella* Open Low Heath.
Description	*Banksia sessilis* (Parrot Bush) with variable in density (2–70%) and up to 1.9 m high. Other common taller shrubs over 1 m include *Hakea trifurcata* and *Xanthorrhoea preissii.* The Low Heath vegetation contains common species including *Hibbertia hypericoides, Calothamnus quadrifidus, Acacia pulchella, Melaleuca systena, Xanthorrhoea brunonis, Jacksonia calcicola, Austrostipa flavescens, Tricoryne elatior, Hemiandra pungens* and *Conostylis aculeata.*
Photograph	

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Sublease 1

Meteor Stone

Sublease 2

Sublease 3

Mining Tenement M70/138

Meteor Stone

Limestone

Processing

Proposed

Action

Area

Lot 7

Legend

Vegetation Complexes after Heddle et al

- Cottesloe Complex-Central and South
- Karrakatta Complex-Central and South
- Proposed Action Area

Scale: 1: 5,518
Original Size: A3
Imagery source: NearMap October 2023 MPP 0.597
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 100 200 m

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 6

Vegetation Complexes after Heddle et al

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MBS ENVIRONMENTAL

\\mbssvr\working\Meteor Stone\GIS\Wesco Road Sublease 5.qgz 25/01/2024 F6 Vegetation Complexes

3.1.7.4 Vegetation Condition

An assessment of vegetation condition was undertaken by Dr Paul van der Moezel of PGV Environmental (2021) in 2020 using the rating scale after Keighery as described in *Bush Forever, Volume 2* (Government of Western Australia, 2000), with the majority assessed as being in Excellent Condition. The rating scale and its descriptors is provided in Table 4, with the outcomes of the condition assessment carried out by PGV Environmental provided in Figure 7.

Table 4: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

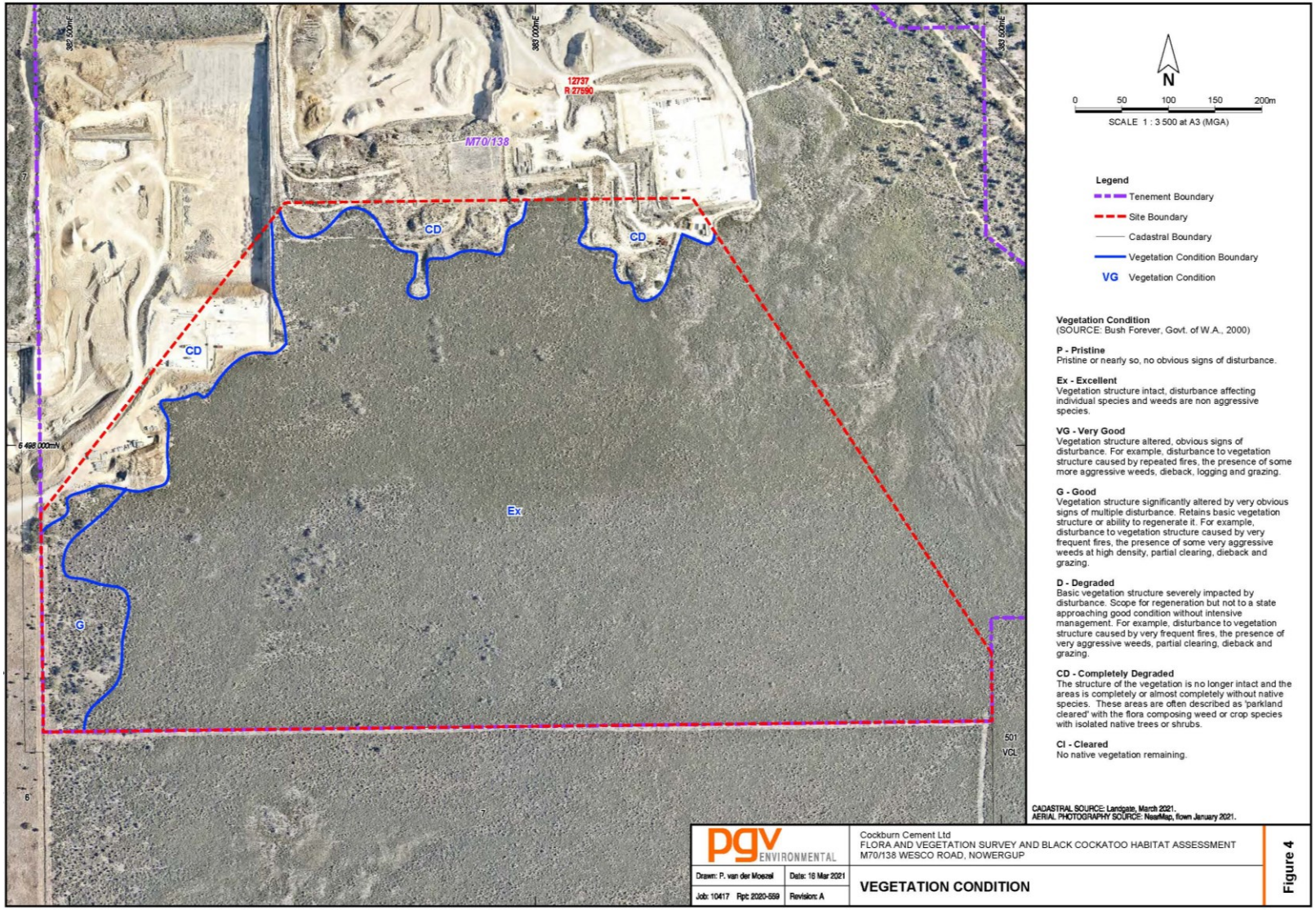

Figure 7: Vegetation Condition (PGV Environmental, 2021)

3.1.8 Land Use

The Proposed Action Area is located within a portion of Lot 12737 (210) Wesco Road, Nowergup, and mining tenement M70/138, within the City of Wanneroo. Lot 12737 is 98.95 ha and is zoned 'Rural' under the Metropolitan Region Scheme. Native vegetation covers approximately two thirds of the Lot, with the remaining land subject to historic and current limestone extraction operations dating back more than 90 years (Randazzo, 2022, Heritage Council, 2017a, b). The Proposed Action Area is currently vegetated and will need to be cleared prior to limestone extraction activities commencing (Figure 8) with existing limestone extraction being carried out by Meteor Stone and others to the north of the Site. Surrounding land uses to the north, west and south of the M70/138 tenement includes several other quarry operations as well as market gardens and poultry farms. Land use to the east includes pine plantations under state forest tenure.

a) Current land use – Proposed Action Area b) Current limestone extraction, Sublease 1

Figure 8: Current Land Use

Landgate historic aerial imagery shows disturbance on the site goes back to the early 1970s with mining exploration activities occurring across the entire Lot before mining activity commenced in the northwest of the Site sometime between 1995 and 2000 (GHD, 2014). Utilisation of the limestone resource within the tenement area dates back more than 90 years when it was used in calcination processes to create quick lime (Randazzo, 2022, Heritage Council, 2017a, b).

3.1.8.1 Foraging Habitat Quality

To assist with determining value of the Proposed Action Area as Carnaby's Cockatoo foraging habitat given this is likely to be the only species of black cockatoo currently utilising the site, consideration was given to the presence of known preferred foraging species, Site condition, the absence of trees that could provide roosting and/or nesting habitat, and evidence of threatening process such as the presence of weeds. This value was informed by the PGV environmental 2021 survey report combined with site observations made by MBS personnel in 2022. Accordingly, the following are indicators of the high value of the PAA as Carnaby's Cockatoo foraging habitat:

- The Proposed Action Area is dominated by native Kwongan Heath with a projected foliage cover of greater than 30% that includes known preferred foraging species including *Banksia sessilis* (Parrot Bush) and *Hakea trifurcata* (Two-leaf Hakea).
- There are no taller trees such as Marri, Jarrah, or Tuart due to the shallow soils overlying the limestone, thus no breeding or roosting habitat is present.
- There is a low percentage of tree deaths.
- While there is some evidence of disturbance in the form of weeds along tracks and evidence of cattle grazing west of the Proposed Action Area, however, much of the habitat is intact heathland.

The projected foraging value informs the level of impact the proposed clearing is likely to have on the cockatoo population, and thus the need and area of an offset to counterbalance the loss of foraging habitat. Applying the foraging quality scoring tool template available in the current *Referral Guidelines for Three WA Threatened Black Cockatoo Species: Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest Red-tailed Black Cockatoo* (Department of Agriculture, Water, and the Environment (DAWE), 2022), to the PAA site characteristics, the foraging habitat is rated as a 10 (Figure 9) as there is:

- Evidence of feeding within the PAA.
- There are an estimated 30,000 ha of foraging habitat within 12 km.
- Carnaby's Cockatoo breeding and roosting sites have been recorded within 12 km.
- No evidence of *Phytophthora cinnamomi* present.

3.2 FLORA SPECIES

Flora surveys were carried out by PGV Environmental in 2020 (PGV, 2021) and by GHD in 2013 (GHD, 2014). A combined total of 119 flora species were recorded during these surveys, with 97 recorded by PGV (2021), with the GHD 2013 survey recording an additional 22 species (GHD, 2014). Of the 119 species recorded, 87 were native and 32 were introduced (weeds).

3.2.1 Conservation Significant Flora

A search of the DBCA threatened and priority listed flora (2022c) and the WA Herbarium databases (DBCA, 2022c) indicated the potential for 35 species listed under the BC Act and/or the EPBC Act within a 10 km radius. Of those 35 species, two, the *Melaleuca* sp. Wanneroo (Threatened, Endangered under the BC Act and Endangered under the EPBC Act) and the *Eucalyptus argutifolia* (Yanchep Mallee) (Threatened, Vulnerable under the BC Act, and Vulnerable under the EPBC Act), have been recorded within 2 km of the Proposed Action Area but not within its boundary or the broader Sublease 5 area (DBCA 2022c, d), with none recorded during the survey carried out by PGV Environmental (2021) in 2020. Indicative locations of *Melaleuca* sp. Wanneroo and *Eucalyptus argutifolia* are provided in Figure 10.

The Protected Matters Search Tool (PMST) report using a 5 km search radius indicated the potential presence of 13 flora species listed as matters of national environmental significance (MNES), including the *Melaleuca* sp. Wanneroo and *Eucalyptus argutifolia*. An assessment of the likelihood of each of these species occurring within the Potential Action Area is provided in Table 5. A copy of the PMST report is provided in Appendix 3.

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Legend

- Foraging Habitat Quality - 10
- Proposed Action Area
- M70 138 Boundary

Scale: 1: 2,229
Original Size: A3
Esri Aerial Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 75 150 m

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 9

Carnaby's Cockatoo Proposed Action Area
Foraging Habitat Quality

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Sublease 1

Meteor Stone

Sublease 2

Sublease 3

Mining Tenement M70/138

Meteor Stone

Limestone

Processing

Lot 6

Proposed Action Area

Lot 7

Legend

Indicative Conservation Significant Flora Locations

Eucalyptus argutifolia

Melaleuca sp. Wanneroo

Proposed Action Area

M70 138 Boundary

382,000 382,400 382,800 383,200 383,600

Scale: 1: 5,000
Original Size: A3
Imagery Source: NearMap October 2023 MPP0.597
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 100 200 m

Meteor Stone Pty Ltd
EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 10

Indicative Conservation Significant Flora Locations

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Table 5: Assessment of Flora Species Listed as MNES Under the EPBC Act

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record	Monitoring Requirements
Andersonia gracilis	Slender Andersonia	Endangered	Found in seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils with low open heath vegetation (Department of Environment and Conservation, 2006).	**No**, suitable habitat is not present within the proposed clearing area.	Not recorded within 10 km	Not required
Anigozanthos viridis subsp. *Terraspectans*	Dwarf Green Kangaroo Paw	Vulnerable	Occurs in winter-wet depressions, growing on grey sandy clay-loam or grey sand in associated with Slender-leaved Banksia (*Banksia leptophylla*) and the Compact Feather Flower (*Verticordia densiflora*), neither of which have been recorded in the proposed clearing area (Department of the Environment, Water, Heritage and the Arts, 2008a).	**No**, suitable habitat not present and associated flora species not recorded during surveys.	Closest DBCA WA Herbarium record is more than 15 km to the southeast.	Not required
Caladenia huegelii	Grand Spider Orchid	Endangered	Occurs in areas of mixed Jarrah and Banksia woodland with a range of associated species on deep, grey-white sands of the Bassendean dune system (Department of Environment and Conservation, 2009b)	**No**, suitable habitat not present and key associated flora species not recorded during surveys.	Closest DBCA threatened and priority flora list database search record is more than 10 km to the southeast.	Not required
Diuris micrantha	Dwarf Bee-orchid	Vulnerable	Found on dark grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps from the east of Kwinana and further south towards Frankland (Department of the Environment, Water, Heritage and the Arts, 2008b)	**No**, suitable habitat not present. Not recorded during surveys.	Proposed clearing area well north of known populations.	Not required

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record	Monitoring Requirements
Diuris purdiei	Purdie's donkey-orchid	Endangered	Found in sand to sandy clay soils in areas that are subject to winter inundation, with associated flora species including native sedges and dense heath with scattered Melaleuca preissiana, Corymbia calophylla, Eucalyptus marginata, and *Nuytsia floribunda*. (Department of the Environment, Water, Heritage and the Arts, 2008c).	**No**, suitable habitat not present. Associated flora species not recorded during surveys.	Not recorded within 10 km; tends to occur further south.	Not required
Drakaea elastica	Glossy-leafed hammer orchid	Endangered	Grows on bare sand patches within dense vegetated patches such as banksia woodland or spearwood thickets in low-lying areas along winter-wet swamps (Department of Environment and Conservation, 2009a).	**No**, suitable habitat is not present in the form of low-lying areas and winter-wet swamps.	Not recorded within 10 km.	Not required
Drakaea micrantha	Dwarf hammer orchid	Vulnerable	Typically occurs in infertile grey sands in cleared firebreaks or disturbed open sandy patches with associated species including Jarrah (*Eucalyptus marginata*) and Common Sheoak (*Allocasuarina fraseriana*) (Department of the Environment, Water, Heritage and the Arts, 2008d).	**No**, suitable habitat and associated species are not present within proposed clearing area.	Not recorded within 10 km.	Not required
Eleocharis keigheryi	Keighery's Eleocharis	Vulnerable	Grows in small clumps on clay or sandy loam soils and is emergent in freshwater creeks and claypans (Department of the Environment, Water, Heritage and the Arts, 2008e).	**No**, suitable habitat is not present within the proposed clearing area.	Not recorded within 10 km.	Not required

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record	Monitoring Requirements
Eucalyptus argutifolia	Yanchep Mallee	Vulnerable	Grows on slopes or gullies close to the summits of limestone ridges with shallow well drained soils. Associated with Parrot Bush (*Banksia sessilis*) (Department of the Environment, Water, Heritage and the Arts, 2008f). Recorded in nearby locations.	**No**, despite the presence of suitable habitat, the PGV Environmental 2020 survey did not record any *Eucalyptus argutifolia* individuals or populations. PGV identified this species as possibly being present when undertaking their survey activities; it is readily identifiable out of season due to its lifeform.	Recorded 200 m to the northwest, 650 m to the north, and 400 m to the east, with none located in M70/138.	Secondary methods will be employed, such as the need for dust control as required as the populations are located on private property.
Macarthuria keigheryi	Keighery's Macarthuria	Endangered	Typically found in winter-wet damp, grey/white sands in open patches with a low tree canopy among heathland, Jarrah (*Eucalyptus marginata*) and Allocasuarina/Banksia Woodland (Department of Environment and Conservation, 2009c).	**No**, suitable habitat is not present within the proposed clearing area.	Not recorded within 10 km.	Not required
Marianthus paralius		Endangered	Occurs in small rocky limestone cliffs within 100 m of the sea edge (Threatened Species Scientific Committee, 2018).	**No**, proposed clearing site is not located within 100 m of the sea edge, thus suitable habitat is not present.	Recorded 8 km to the southwest.	Not required
Melaleuca sp. *Wanneroo*		Endangered	Typically grows in dense patches on shallow soils over limestone 'caprock' on ridges; associated with *Melaleuca systena* (Threatened Species Scientific Committee, 2019a).	**No**, despite the presence of suitable habitat, the PGV Environmental 2020 survey did not record any *Melaleuca* sp. Wanneroo individuals or populations.	Individuals recorded approximately 400 m to the northwest and 900 m to the south. Two individuals within M70/138 north of the proposed clearing area were cleared prior to species being listing as Endangered.	Secondary methods will be employed, such as the need for dust control in high wind conditions, as the populations are located on private property.

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record	Monitoring Requirements
Paracaleana dixonii	Sandplain Duck Orchid	Endangered	Grows in deep sand in open areas beneath dense, tall shrubs with scattered banksia or in heathland in shallow sand over laterite (Department of the Environment, Water, Heritage and the Arts, 2008g).	**No**, suitable habitat is not present within the proposed clearing area. Tends to occur in locations north of the proposed clearing site.	Not recorded within 10 km.	Not required

Source: DBCA, 2022d; DCCEEW, 2022

3.3 THREATENED ECOLOGICAL COMMUNITIES

A search of the DBCA threatened and priority ecological community (TEC, PEC) database indicates that while there are several conservation significant ecological communities present in proximity to the Proposed Action Area, there are none within its boundaries, the Sublease 5 area, or within mining tenement M70/138. There are records of several ecological communities that are listed under the BC Act and/or the EPBC Act that have the potential of occurring within 5 km of the Proposed Action Area (Table 6, Appendix 3, with the closest being approximately 400 m to the south and others ranging from 500 – 900 m from the Site.

The flora and vegetation survey carried out by PGV Environmental (2021) confirmed that there no threatened ecological communities listed under the EPBC Act within the Proposed Action Area or the immediate surrounds, with the floristic community present within the Site being consistent with *SCP24 Northern Spearwood Shrublands and Woodlands* that is listed as a Priority 3 ecological community under the BC Act. While SCP24 is an ecological community dominated by Banksia species, it is *Banksia sessilis* (parrot bush) rather than those associated with the Banksia Woodlands of the Swan Coastal Plain ecological community (Banksia WL SCP).

Table 6: Conservation Significant Ecological Communities

Ecological Community	Description	WA Conservation Status	EPBC Act Status	Likelihood	Closest Record
Caves SCP01	Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain.	Critically Endangered	Endangered	**No**, no caves present.	5 km to northwest
SCP19b	Woodlands over sedgelands in Holocene dune swales of the southern Swan Coastal Plain (original description, Gibson et al., 1994).	Critically Endangered	Endangered (listed as FCT 19)	**No**, no sedgelands present.	Not recorded within 15 km
SCP20a	*Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al., 1994).	Endangered	Endangered	**No**, dominant Banksia species present is *Banksia sessilis* rather than *Banksia attenuata.*	2 km to the east and 3.5 km to southeast
SCP21c	Low lying *Banksia attenuata* woodlands or shrublands.	Priority 3	Endangered as part of Banksia WL SCP	**No**, dominant Banksia species present is *Banksia sessilis* rather than *Banksia attenuata.*	8.5 km to the east
SCP22	*Banksia ilicifolia* woodlands.	Priority 3	Endangered as part of Banksia WL SCP	**No**, dominant Banksia species present is *Banksia sessilis* rather than *Banksia ilicifolia.*	4.7 km to the northeast
SCP23b	Swan Coastal Plain *Banksia attenuata – Banksia menziesii* woodlands.	Priority 3	Endangered as part of Banksia WL SCP	**No**, dominant Banksia species present is *Banksia sessilis* rather than *Banksia attenuata and Banksia menziesii.*	7 km to the northeast and 8.8 km to the east
SCP24	Northern Spearwood Shrublands and Woodlands.	Priority 3	Critically Endangered as part of Tuart Woodland TEC	**Yes**, PGV Environmental survey determined that the site vegetation was consistent with this FCT. No Tuart on site, thus not listed at a Commonwealth level.	1.9 km to the west
SCP25	Southern *Eucalyptus gomphocephala – Agonis flexuosa* woodlands.	Priority 3	Critically Endangered as part of Tuart Woodland TEC	**No**, no Tuart or Peppermint on site.	9.3 km to the south

Ecological Community	Description	WA Conservation Status	EPBC Act Status	Likelihood	Closest Record
SCP26a	*Melaleuca huegelii – Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al., 1994).	Endangered	Critically Endangered as from 15 November 2023	**No**, while *Melaleuca systena* is present, it is not a dominant overstorey species	500 m to the south
SCP29a	Coastal shrublands on shallow sands.	Priority 3		**No**, site is not located in a coastal area	8.4 km to the southwest
SCP29b	Acacia shrublands on taller dunes.	Priority 3		**No**, while *Acacia pulchella* is present, it is not a dominant overstorey species	7.5 km to the southwest
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain.	Priority 3	Endangered	**No**, dominant Banksia species present is *Banksia sessilis* rather than those listed as key to determining the presence/absence of this community (Threatened Species Scientific Committee, 2016a)	500 m to the east
Tuart Woodlands	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	Priority 3	Critically Endangered	**No**, no Tuart on site (Threatened Species Scientific Committee, 2019b)	800 m to the south, 1 km to the west and north

Source: DBCA, 2022e, DCCEEW, 2022

3.4 TERRESTRIAL FAUNA

A review of the DBCA (2022f) Threatened and Priority Fauna Database search indicated that only the Carnaby's Cockatoo (*Zanda latirostris*) (Endangered at a State and Commonwealth level) has been recorded within 500 m of the Proposed Action Area, with this species observed on Site in November 2022 during a visit with representatives from DEMIRS.

A review of potential fauna species listed as being likely or known to occur on the Protected Matters Search Tool (PMST) (DCCEEW, 2022, Appendix 3 within the Proposed Action Area or its surrounds was undertaken, including providing an opinion as to why its presence is or is not likely. A 5-km search buffer was used, thus provides results for a range of habitats that may be suited to one or more species and/or communities present beyond the proposed clearing area, in addition to that located within the Site boundary. The search also includes several marine bird, fish and mammal species that have been excluded from this assessment process as there is no suitable habitat to support their presence within the proposed clearing area or its immediate surrounds. Table 7 provides outcomes of the MNES assessment which considered the potential presence of:

- Five terrestrial bird species.
- One insect.
- Two mammals.

Of these species, one is likely to occur within the proposed clearing area based on the known habitat requirements of each along and the habitat present within the site, namely the Carnaby's Cockatoo (*Zanda latirostris*) (Table 7). Evidence of feeding by the Carnaby's Cockatoo was recorded during the 2020 black cockatoo habitat assessment carried out by PGV Environmental (2021).

Note that the while the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) has been recorded north of Lake Joondalup in the Nowergup area, it was observed feeding on Marri (*Corymbia calophylla*), along with Jarrah (*Eucalyptus marginata*), Pricklybark (*Eucalyptus todtiana*) and to a lesser degree in Tuart (*Eucalyptus gomphocephala*), rather than on Banksia species (Bamford *Pers. Comm.*, 2022), thus their presence is unlikely within the Proposed Action Area as their preferred feeding species are not present (Bamford *Pers. Comm.*, 2022). No other matters of national environmental significance (MNES) are likely to be impacted as a result of this proposed action.

Table 7: Assessment of Likely Faunal MNES Presence

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record
Birds					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	Vulnerable	Primarily feeds on the seeds of Jarrah and Marri in woodlands and forests, as well as Tuart (*Eucalyptus gomphocephala*), Sheoak (*Allocasuarina fraseriana*), various Hakea's, and a range of introduced species. Breeds in mainly live or dead Eucalypt trees including Tuart, Jarrah, and Marri. (Department of Agriculture, Water and the Environment, 2022).	**Unlikely**, no tall trees such as Jarrah, Marri and/or Tuart are present within the proposed clearing area that could provide foraging, roosting, and or breeding habitat. It is recognised that while the FRBC will forage on hakea, there is no evidence of its presence within the Proposed Action Area; *Banksia sessilis* (Parrot Bush) is the dominant species present.	Recorded 6.5 km to the southeast.
Leipoa ocellata	Mallefowl	Vulnerable	Typically located in semi-arid and arid shrublands and low woodlands dominated by mallee and/or acacia with a sandy substrate and an abundance of leaf litter to create nests suitable for egg incubation (Benshemesh, 2007).	**No**, likely to be locally extinct. Tends to occur in the wheatbelt east of the Swan Coastal Plain.	Not recorded within 10 km.
Motacilla cinerea	Grey Wagtail	Migratory	Typically associated with water, along with rocky substrates along water courses, as well as lakes and marshes (Department of the Environment, 2015).	**No**, uncommon migrant, non-breeding; suitable habitat is not present within the proposed clearing area.	Not recorded within 10 km.
Pandion Haliaetus	Osprey	Migratory	Associated with a range of aquatic environments, including bays, estuaries, tidal stretches of coastal rivers, mangrove swamps, coral and rock reefs, terrestrial wetlands, coastal areas, nesting in trees and a range of artificial structures (Department of the Environment, 2015).	**No**, suitable habitat is not present within proposed clearing area.	Not recorded within 10 km.

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record
Zanda latirostris	Carnaby's Cockatoo	Endangered	Primarily feeds on a range of proteaceous species in Kwongan heathland and woodlands dominated by various Banksia, Hakea, and Grevillea species; also feeds on a range of introduced species. Breeds in mainly live or dead Eucalypt trees including Tuart, Jarrah, and Marri (Department of Agriculture, Water and the Environment, 2022).	**Yes**, Likely foraging presence, but no suitable trees present for roosting or nesting. PGV Environmental confirmed the presence of six known preferred feeding species during their 2020 survey, including *Banksia sessilis* (Parrot Bush), which is a dominant species at the site. Also observed during 2022 site visit.	Numerous records in area surrounding M70/138. Flock sighted during November 2022 Site visit. PGV Environmental noted feeding evidence on the *Banksia sessilis* during their 2020 survey.
Insect					
Hesperocolletes douglasi	Douglas' Broad-headed Bee	Critically endangered	Associated with Banksia Woodlands of the Swan Coastal Plain TEC. Pollen load analysis identified pollen of eight species from five families, namely *Philotheca spicata* (Rutaceae), *Levenhookia stipitata*, *Stylidium hesperium*, *S. rigidulum*, *Stylidium* sp. (Stylidiaceae), *Patersonia occidentalis* (Iridaceae), *Bossiaea eriocarpa* (Fabaceae), and *Eremaea pauciflora* (Myrtaceae) (Pille Arnold et al., 2019).	**Unlikely**, known from a single population in Pinjar approximately 5 km to the northeast. No Banksia Woodland TEC is present within the proposed clearing area. Of the eight different pollen grains identified from the most recent collection of this species (Pille Arnold et al., 2019), only the *Bossiaea eriocarpa* has been recorded within the proposed clearing area.	Not recorded within 5 km.

Scientific Name	Common Name	Conservation Code	Habitat Requirements	Likelihood	Closest Record
Mammal					
Dasyurus geoffroii	Chuditch, Western Quoll	Vulnerable	A range of habitats are utilised, including Jarrah Forest, Mallee Shrublands, Woodlands, and Desert, with most natural populations known from Jarrah forests and in woodland and mallee shrublands and heaths along the south coast and east to Ravensthorpe (Department of Environment and Conservation, 2012).	**Unlikely**, believed to be locally extinct.	Recorded approximately 4 km to the north of the Site based on a written historical record.
Macroderma gigas	Ghost Bat	Vulnerable	Endemic to northern Australia. Relies on caves, rock crevices and old, typically deep, mines to provide suitable roost microclimates with a temperature range of 23 – 28°C and humidity of 50 – 100% (Threatened Species Scientific Committee, 2016b).	**No**, no caves with suitable characteristics within the proposed clearing area; endemic to northern Australia.	Not recorded within 10 km.

Sources: DBCA, 2022, DCCEEW, 2022

3.5 SURVEY ACTIVITIES

PGV Environmental carried out a flora, vegetation, and black cockatoo habitat assessment of a portion of M70/138 that included the Proposed Action Area, with results documented in their 2021 report. The survey was:

- Carried out less than five years ago by Dr Paul Van der Mosel, a botanist with more than 30 years' experience carrying out flora and vegetation surveys on the Swan Coastal Plain, as well as experience carrying out black cockatoo assessment activities.
- The flora and vegetation assessments were carried out in spring, in accordance with *Technical Guidance — Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016).
- The cockatoo habitat assessment was carried out in accordance with the then referral guidelines, EPBC Act *Referral Guidelines for Three Threatened Black Cockatoo Species: Carnaby's Cockatoo* (endangered) *Calyptorhynchus latirostris)*, *Baudin's Cockatoo* (vulnerable) (*Calyptorhynchus baudinii*), *Forest Red-tailed Black Cockatoo* (vulnerable) *Calyptorhynchus banksii naso* (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2012b). The habitat assessment method applied is consistent with the survey methods recommended in the *Survey Guidelines for Australia's Threatened Birds* (DEWHA, 2017) to determine the presence of black cockatoos within the Proposed Action Area.

4. LISTED THREATENED SPECIES AND ECOLOGICAL COMMUNITIES (S18 AND S18 (A))

Additional information relating to the Threatened Species and Communities that have potential to be impacted by the proposal have been provided in this Section, namely:

- Carnaby's Cockatoo (*Zanda latirostris*) (CBC), Endangered.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (FRTBC), Vulnerable.
- Baudin's Cockatoo (*Zanda baudinii*) (BBC), Endangered.
- *Melaleuca* sp. Wanneroo, Endangered.
- Yanchep Mallee (*Eucalyptus argutifolia*), Vulnerable.

In providing this additional information, consideration has been given to information included in *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (Department of the Environment, 2013).

4.1 CARNABY'S COCKATOO

4.1.1 Likely Impacts

Based on site conditions present within the Proposed Action Area, the clearing will have a direct impact on foraging activities by the Carnaby's Cockatoo (Department of Parks and Wildlife, 2013), with no impact on breeding and roosting activities. Evidence of foraging was observed during the survey carried out by PGV Environmental in 2020, with a flock observed directly during the site visit on 09 November 2022. The proposed clearing represents a temporary, albeit lengthy impact timeframe of some 10 – 20 years for operational activities followed by a period of time after rehabilitation will occur, during which the Carnaby's Cockatoo will not be able to access the foraging resource. Data relating to Banksia Woodland restoration indicates that good results can be achieved within 5 – 10 years (Stevens et al., 2016; Brundrett, 2018; and Murdoch University, 2023). It is expected that rehabilitation will restore an ecosystem with similar flora species to that which is currently present, as indicated in the MCP (Landform Research, 2020). A rehabilitation strategy for the PAA is provided in Appendix 4.

4.1.1.1 Foraging on Site

A flora and vegetation assessment, along with an assessment of black cockatoo habitat was carried out by Dr Paul van der Moezel in October 2020 (PGV Environmental, 2021) (Appendix 5). That assessment:

- Confirmed the presence of five preferred Carnaby's Cockatoo foraging species, namely:
  - Three high-value species: *Banksia sessilis*, *Hakea prostrata*, and *Hakea trifurcata.* The *Banksia sessilis* and *Hakea trifurcata* are the two dominant overstorey species at 1.9 and >1 m respectively, with the density of the Banksia sessilis ranging in density from 2 – 70% (PGV Environmental, 2021).
  - One medium value species: *Xanthorrhoea preissii*; co-dominant with *Banksia sessilis* and *Hakea trifurcata*.
  - One low value species: *Banksia dallanneyi*.
- The vegetation type present throughout the Proposed Action Area was primarily dense *Banksia sessilis*/*Hakea trifurcata*/*Xanthorrhoea preissii* Tall Open Scrub over *Hibbertia hypericoides*/*Calothamnus quadrifidus*/*Acacia pulchella* Open Low Heath (Figure 11). This vegetation type is consistent with FCT 24 Northern Spearwood Shrublands and Woodlands and is not listed as a priority or endangered ecological community at either a State or Commonwealth level.
- Feeding debris indicative of Carnaby's Cockatoo was found during the survey carried out by PGV Environmental in 2020. During a November 2022 visit to the Site with DEMIRS representatives, a flock of

Carnaby's Cockatoo were observed to the south, close to the Proposed Action Area, and it is expected that feeding occurred on that occasion.

Figure 11: *Banksia sessilis* Dominated Scrub, Proposed Action Area

4.1.1.2 Foraging Habitat up to 20 km from the PAA

Black Cockatoos, including Carnaby's Cockatoo, are known to forage within a 12-km range while breeding and up to 20 km when not breeding (DAWE, 2022). The proposed clearing area is located north of Perth, with large areas of native vegetation retained within 5 km of the site in the form of TEC and PEC locations and their associated buffers. There are also large areas of other vegetation within 12 km and 20 km of the proposed clearing area, including relatively undisturbed stands of native vegetation and rehabilitation that have occurred after disturbance such as sand and limestone extraction activities.

To arrive at an indicative area of black cockatoo foraging habitat within 12 km of the proposed clearing location, the following datasets and database search outcomes were accessed:

- Threatened and Priority Ecological Community database using a 5-km search radius (DBCA, 2022e).
- Vegetation Complexes — Swan Coastal Plain (DBCA-046) dataset (DBCA, 2018).
- Native Vegetation Extent (DPIRD-005) dataset (DPIRD, 2020).
- Pre-European Vegetation (DPIRD-006) dataset (DPIRD, 2019b).

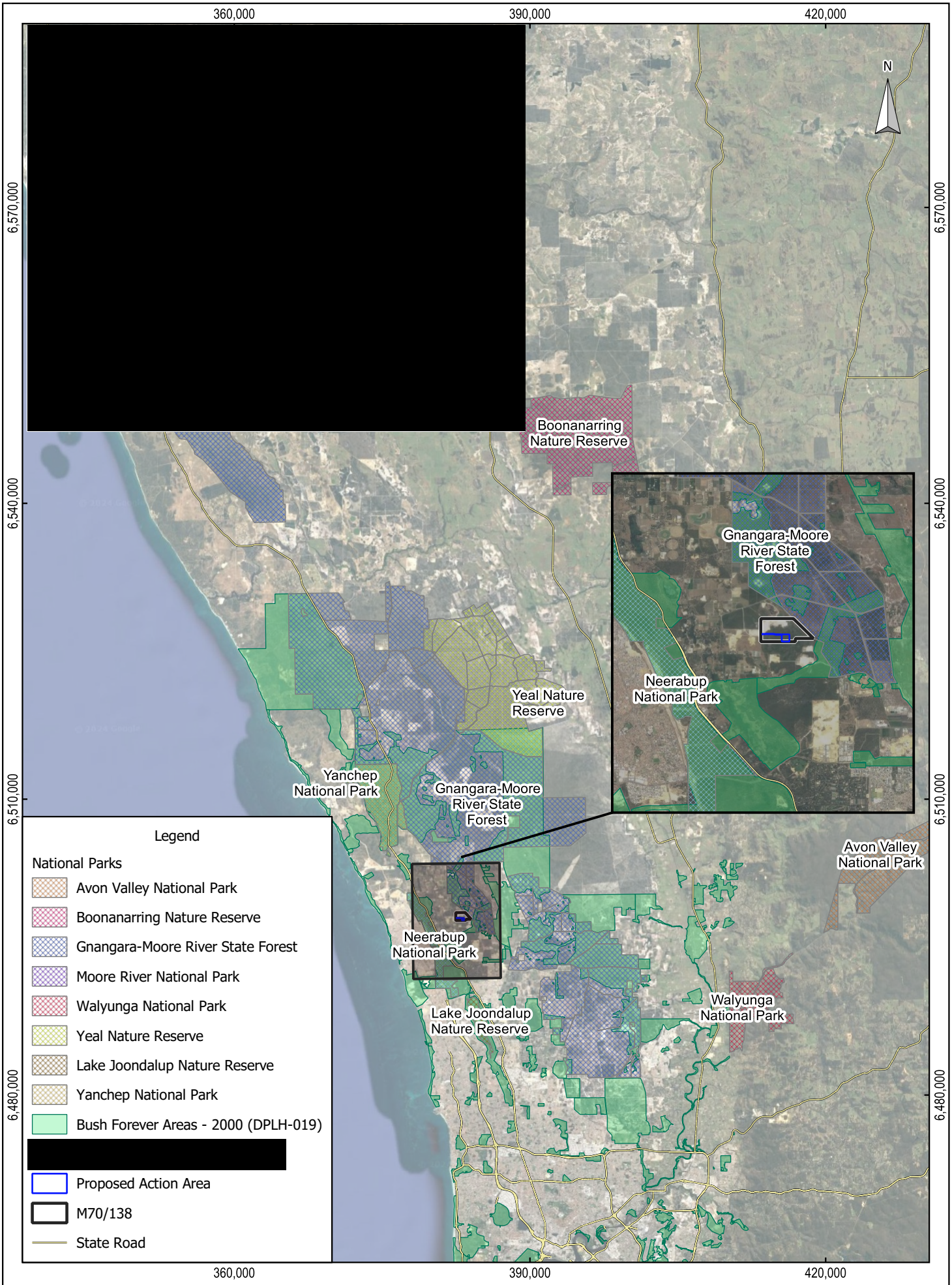
This assessment method is consistent with that documented in the survey report prepared by Bamford Consulting Ecologists (2024) (Appendix 6) when assessing the Cockatoo habitat at the proposed offset site.

In addition, several of the following reserves are within 20 km of the Proposed Action Area, with key reserves shown in Figure 12:

- Avon Valley National Park.
- Boonanarring Nature Reserve.
- Bush Forever Sites.
- Coastal foreshore reserve areas.

- Gnangara-Moore River State Forest.
- Lake Joondalup Nature Reserve — 4 454.484 ha, approximately 8 km to the south, managed by the Cities of Wanneroo and Joondalup.
- Moore River National Park.
- Neerabup National Park — 11 670 ha, approximately 3 km to the west; managed by DBCA.
- Various bushland remnants associated with wetland reserves.
- Walyunga National Park.
- Whiteman Park.
- Yanchep National Park — 2 854 ha, approximately 10 km to the northwest, managed by DBCA.
- Yeal Nature Reserve — 11 443 ha, approximately 20 km to the north, managed by DBCA.
- Yellagonga Regional Park.

Each of these locations includes areas of native vegetation in good or better condition that provide roosting, foraging, and potential nesting habitat for black cockatoo species, see also the discussion relating to foraging habitat in Section 4.1.1.2 and breeding and roosting behaviour in Section 4.1.1.5.



Scale: 1: 500,000
Original Size: A4
Imagery: Google Satellite/Nearmap
Grid: GDA94 / MGA zone 50
0 7.5 15 km

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Figure 12

Nature Reserves

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\\mbssvr\working\Meteor Stone\GIS\GIS-Common_LocationPlan.qgz 15/05/2024 Fig12 Nature Reserves

Threatened and Priority Ecological Community Database

A review of a DBCA (2022e) Threatened and Priority Ecological Community database search for a nearby location that used a 5-km search radius indicated the following ecological communities were present:

- *Banksia attenuata* woodland over species rich dense shrublands (floristic community type (FCT) 20a).
- Banksia dominated woodlands of the Swan Coastal Plain.
- *Banksia ilicifolia* woodlands (FCT 22).
- *Melaleuca huegelii – Melaleuca systena* shrublands on limestone ridges (FCT 26a).
- Northern Spearwood shrublands and woodlands (FCT 24).
- Shrublands on dry clay flats (FCT 10a).
- Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain.

Each of these ecological communities includes one or more known black cockatoo foraging species, thus all patches represent foraging habitat for the Carnaby's Cockatoo, as well as the Forest Red-tailed Black Cockatoo, and probably the Baudin's Cockatoo. The approximate collective area of these communities is 8662.9 ha, including the 200 – 500-m buffer applied around each patch or group of patches (Figure 13). Note that the shapefile provided by the DBCA in response to the ecological community database search request was inclusive of the relevant buffer areas and the data was used in the form it was provided.

Vegetation Complexes — Swan Coastal Plain (DBCA-046)

A review of the Vegetation Complexes — Swan Coastal Plain (DBCA-046) (DBCA, 2018) dataset enabled a compilation of area (ha) by vegetation complex within a 12-km and 20-km radius of the proposed Meteor Stone clearing area (Figure 14). The method used to extract the areas was tracing polygons provided in the DBCA-046 dataset, with separate consideration of those within the 12-km breeding and the 12 – 20-km non-breeding foraging zones. It is recognised that while there are inaccuracies associated with the method used to obtain the areas, it is unlikely that it will result in significant inaccuracies when estimating the amount of collective black cockatoo foraging habitat. No consideration has been made of the relative value of each vegetation complex as a foraging source, as it is dependent on the preferred species present, the condition of that vegetation in terms of disturbances, such as those associated with the presence of dieback or fire. It is also recognised that the estimations consider foraging habitat for the three black cockatoo species collectively, with each having preferred foraging species.

Table 8 provides a summary of each of the 13 vegetation complexes described by Heddle, Loneragan, and Havel (1980) within 12 km and 20 km of the proposed clearing area, along with areas of foraging habitat calculated based on areas of pre-European development (DBCA, 2018) with a subtraction of the obviously developed or cleared areas. Based on the collective estimation of black cockatoo foraging habitat present within the 12-km breeding and 20-km non-breeding foraging radii, the following can be inferred:

- The clearing of 6.495 ha of quality foraging habitat proposed by Meteor Stone will not result in a significant reduction of food sources available to breeding and non-breeding black cockatoos that might utilise the site.
- The clearing of 6.495 ha represents the loss of 0.021% of foraging habitat within 12-km zone, 0.015% within the 12 – 20-km zone, and 0.009% over the entire 20-km zone.
- While the proposed clearing area represents quality habitat based on the species present, the condition of the site with evidence of few disturbances, along with its connectivity to other foraging/habitat locations, the site is unlikely to be critical to the continued presence of black cockatoos, with extensive alternative foraging locations available.
- This situation is likely to remain the case if additional areas are cleared within the broader sublease five area or within other areas of mining tenement M70/138.

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6,480,000

N

Legend

- TEC and PEC Locations (Approx. 8663 ha)
- Proposed Action Area (6.495 ha)
- 12 km black cockatoo foraging
- 20 km black cockatoo non-breeding foraging

Scale: 1: 170,000
Original Size: A3
Imagery Source: Esri Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 5 10 km

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EPBC Act Preliminary Documentation
Portion of Sublease 5 Area

Figure 13

TEC, PEC Collective Locations including Buffer Area and 12 km and 20 km Foraging zones

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Table 8: Indicative Area of Vegetation Complex within 12-km and 20-km of Proposed Clearing Area

Complex	Description	Approximate area within 12 km (ha)	Approximate area within 20 km (ha)	Black Cockatoo Foraging Habitat
Bassendean Complex Central and South	Low open forest and woodland, with species typically including Tuart and Banksia.	0	1 263.165	Yes
Bassendean Complex Central and South Transition	Woodland and closed scrub, with species including Tuart and Banksia.	411.293	1 706.621	Yes
Bassendean Complex North	Low open forest and low woodland and sedgelands, with species including various Banksia.	8 093.752	16 806.208	Yes
Bassendean Complex North Transition	Low open forest and low woodland, with species typically including Banksia.	270.467	5 272.806	Yes
Cottesloe Complex Central and South	Woodland and open forest and closed heath, with species typically including Jarrah and Tuart.	14 441.186	2 227.425	Yes
Cottesloe Complex North	Low open forest and fringing woodland, with species typically including Banksia and those associated with closed heaths.	1 289.617	5 399.430	Yes
Herdsman Complex	Sedgelands and fringing woodland, with species typically including Flooded Gum and sedgelands.	1 285.063	464.893	Yes
Karrakatta Complex Central and South	Open forest and woodland, with species typically including Jarrah, Tuart, and Banksia.	5 353.007	5 141.198	Yes
Karrakatta Complex North	Low open forest and low woodland, with species typically including Tuart and Banksia.	1 312.236	4 296.280	Yes
Karrakatta Complex North Transition	Low open forest and low woodland, with species typically including Banksia.	675.392	4 654.265	Yes
Pinjar Complex	Woodland to fringing woodland, with species typically including Flooded Gum, Jarrah, and Marri.	4 448.383	424.716	Yes
Quindalup Complex	Coastal dune complex – low, closed forest and closed scrub, with species typically including *Callitris* sp. (e.g.: Rottnest Island Pine).	2 707.579	5 067.412	Yes

Complex	Description	Approximate area within 12 km (ha)	Approximate area within 20 km (ha)	Black Cockatoo Foraging Habitat
Yanga Complex	Closed scrub and low open forest, with species likely to include Marri and Banksia.	0	828.703	Yes
Totals (ha)		**21 530.957**	**34 935.159**	
Cleared areas (ha)		**9 378.509**	**8 677.399**	
Indicative Collective Vegetated Area (ha)		**30 909.466**	**43 612.558**	

Sources: Vegetation Complexes – Swan Coastal Plain (DBCA-046) dataset (DBCA, 2018), and Heddle, Loneragan and Havel (1980)

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Legend

Vegettion Complexes that include Carnaby's Cockatoo Foraging Habitat

- Bassendean Complex-Central and South
- Bassendean Complex-Central and South Transition
- Bassendean Complex-North
- Bassendean Complex-North Transition
- Cottesloe Complex-Central and South
- Cottesloe Complex-North
- Herdsman Complex
- Karrakatta Complex-Central and South
- Karrakatta Complex-North
- Karrakatta Complex-North Transition
- Pinjar Complex
- Quindalup Complex
- Yanga Complex
- Proposed Action Area
- 12 km black cockatoo foraging
- 20 km black cockatoo non-breeding foraging

Scale: 1: 200,000
Original Size: A3
Imagery Source: Esri Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 5 10 km

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Portion of Sublease 5 Area

Figure 14

Vegetation Complexes including Carnaby's Cokatoo Foraging Habitat within 12 and 20 km of the Proposed Action Area

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DPIRD Datasets

The Native Vegetation Extent (DPIRD-005) (DPIRD, 2020) and the Pre-European Vegetation (DPIRD-006) (DPIRD, 2019b) datasets were used as a means of cross-checking assumptions and the appropriateness of the methodology applied to the calculation of the indicative collective amount of black cockatoo foraging habitat present within the 12-km and 20-km breeding and non-breeding foraging zones. The Native Vegetation Extent (DPIRD-005) (DPIRD, 2020) dataset indicated areas considered to be remnant native vegetation with that within the intensive land-use zone in south-western Australia originally derived from LandSat TM imagery collected in 1995, with some corrections based on digital aerial photography collected between 1996 and 2006. Accordingly, there may be some locations with greater or lesser areas of native remnant vegetation according to changing land uses over time. Overall, the extent of the native vegetation indicated in this dataset suggests the calculation of the cleared areas referred to in Table 8 is valid.

The Pre-European Vegetation dataset (DPIRD-006) (DPIRD, 2019b) assesses the vegetation association based on mapping carried out by Beard, with each association assigned a number, in contrast to the mapping carried out by Heddle, Loneragan and Havel, that named their associations based on soils present in an area. The descriptions of the Beard Associations are consistent with those described by Heddle et al. (1980) indicating that the DBCA-046 Vegetation Complexes of the Swan Coastal Plain did provide a suitable dataset to base the indicative areas of collective black cockatoo foraging habitat calculation on. For example, the proposed clearing area is in Beard vegetation association 949 that is described as Low woodland or open low woodland with other acacia, banksia, peppermint, cypress pine, casuarina, York gum, *Acacia* spp., Banksia spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina* spp., and *Eucalyptus loxophleba*, which is generally consistent with the description of the Heddle et al. (1980) Cottesloe Complex – Central and South.

4.1.1.3 Plant Disease

There is no evidence of dieback within the Proposed Action Area, or the broader mining tenement boundary. *Phytophthora cinnamomi* (dieback) is an introduced water-borne fungus that has had and continues to have a devastating impact on native vegetation within the south-western portion of Western Australia. Proteaceous species such as Banksia are very susceptible to its effects, while other species such as Jarrah are moderately vulnerable to its effects. The three dominant flora species recorded in the Proposed Action Area, *Banksia sessilis*, *Hakea trifurcata*, and *Xanthorrhoea preissii*, are all susceptible to dieback (Groves, Hardy, and McComb, undated). However, according to Mykytiuk (2012) and the Dieback Working Group (undated), *P. cinnamomi* does not establish in limestone or limestone soils, such as those present within the Proposed Action Area.

While *P. cinnamomi* is the most common cause of dieback, testing programmes have revealed the presence of other, less well known, *Phytophthora* species that could be as devasting as *P. cinnamomi*, such as *Phytophthora multivora* which has been found to infect *Eucalyptus gomphocephala*, *Corymbia calophylla*, and *Agonis flexuosa*, species typically resistant to *P. cinnamomi* (Scott, Burgess, Barber, Shearer, Stukely, Hardy, and Jung, 2009). According to the DBCA (2020), limestone soils do not inhibit the proliferation of *P. multivora* in the way they do the *P. cinnamomi*. The procedure for responding to a suspected outbreak of dieback within the PAA will be included in the CEMP.

In addition, there is no evidence of Marri Canker (*Quambalaria coyrecup*) as there is no Marri within or in close proximity to the Proposed Action Area.

4.1.1.4 Fire

A review of historical aerial imagery held by Landgate (2023) suggests that a fire impacted vegetation within the M70/138 tenement boundary and surrounding areas sometime between February and September 2015, and this was confirmed by Meteor Stone (Randazzo, Personal Communication, 2023). No other fires are known to have impacted the area.

4.1.1.5 Roosting and Breeding

The vegetation type present within the Proposed Action Area is closely associated with the shallow soils present over the limestone resource, meaning that taller trees, including Jarrah (*Eucalyptus marginata*), Tuart (*E. gomphocephala*), and Marri (*Corymbia calophylla*) are absent as there is insufficient to soil to support their root systems (Figures 11 and 15). That absence means there are no trees of suitable species or size that could be utilised by the Carnaby's Cockatoo for breeding or roosting, thus there will be no impacts to these activities due to the proposed clearing of the Proposed Action Area. The DBCA-054 (DBCA, 2022g) and DBCA-063 (DBCA, 2019a) datasets, along with outcomes of the PGV Environmental (2021) survey activities carried out in spring 2021 confirm that there are no known nesting trees within the proposed clearing area. Accordingly, there will be no impacts to trees with suitable breeding hollows or birds rearing young when the clearing occurs.

Figure 15: Absence of Tall Trees Suitable for Nesting or Roosting

Source: Landform Research, 2022 and MBS Environmental, 2022

However, there are locations within 20 km of the Proposed Action Area where roosting and/or breeding can occur. The DBCA (2019b) dataset Black Cockatoo Roosting Sites – Buffered (DBCA-064) (DBCA, 2019b) was reviewed to gain an indication of known roosting sites within 12 and 20 km of the proposed clearing area. Fifteen locations of varying size within 12 km of the proposed clearing area are recorded, with each including a minimum 1-km buffer around the roosting site (Figure 16). A review of the DBCA (2018) *Carnaby's Cockatoo Confirmed Roost Site* dataset (DBCA-050) indicates there are 11 sites in common with the DBCA-064 dataset (Figure 16).

A review of the DBCA (2019a) dataset *Black Cockatoo Breeding Sites – Buffered* (DBCA-063) indicated the presence of one or more known nesting locations approximately 10 km south of the proposed clearing area (Figure 17); note that each polygon includes a minimum 1-km buffer around any recorded tree. An additional four nesting locations were recorded more than 20 km to the east of the site.

The DBCA-054 dataset (DBCA, 2022g) Carnaby's Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions indicates one breeding area to the north within the 6 km breeding zone that extends beyond the 20-km foraging zone, and another that is located to the east that commences within the 6 – 20-km foraging zone and extends beyond that boundary (Figure 17).

Given the known Carnaby's Cockatoo roosting and breeding locations within 12 km of the PAA, the loss of 6.495 ha of quality foraging habitat represents the loss of 0.03% of the estimated foraging habitat available within 12 km, and 0.02% of the estimated foraging habitat available within 20 km and indicates that breeding cockatoos will continue to have access to a range of quality foraging resources.

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6,480,000

N

Legend

- Black Cockatoo Roosting DBCA 064 Wesco Road
- Proposed Clearing Area
- 12 km black cockatoo foraging
- 20 km black cockatoo non-breeding foraging

Scale: 1: 182,349
Original Size: A3
Imagery Source: Esri Aerial Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)

0 5 10 km

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Portion of Sublease 5 Area

Figure 16

Recorded Black Cockatoo Roosting Locations in Proximity to the Proposed Action Area

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\\mbssvr\working\Meteor Stone\GIS\Wesco Road Sublease 5.qgz 25/01/2024 F15 Roosting Locations

360,000 370,000 380,000 390,000 400,000 410,000 420,000

6,520,000 6,510,000 6,500,000 6,490,000 6,480,000

N

Legend

- Black Cockatoo Breeding DBCA 063 Wesco Rd
- CarnabysCockatooConfirmedBreedingAreaswithintheSw
- Proposed Action Area
- M70 138 Boundary
- 12 km black cockatoo foraging
- 20 km black cockatoo non-breeding foraging

Scale: 1: 180,000
Original Size: A3
Esri Aerial Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 5 10 km

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Figure 17

Known Black Cockatoo Breeding Locations in Proximity to the Proposed Action Area

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4.1.1.6 Watering Points

There are no watering points within the Proposed Action Area nor the broader M70/138 Mining Tenement. However, there are several watering points within the 12-km breeding, roosting, and foraging range of the Proposed Action Area, including a range of:

- Natural and artificial wetlands.
- Artificial drainage basins.
- Artificial water features in local parks.

A review of the Geomorphic Wetlands of the Swan Coastal Plain dataset (DBCA-019) (DBCA, 2022a) identifies various wetland types that could provide a watering source for the various species of black cockatoo at various times of the year (Figure 18).

4.1.1.7 Tenure

Note that is not possible to identify parcels of land individually, nor to confirm their tenure, zoning, or whether development is planned in the near future. The black cockatoo habitat (shown in Figures 13, 14, 16, 17, and 18) is located within the following local government areas (LGAs):

- City of Wanneroo.
- City of Joondalup.
- City of Swan.
- Shire of Chittering.
- Shire of Gingin.

4.1.1.8 Indicative Development Zoning of Cockatoo Habitat

The Proposed Action Area and the majority of the vegetated cockatoo habitat is located within the City of Wanneroo, with example of land zoning within this local government authority including:

- State Forest.
- Conservation Reserve (Parks and Recreation).
- Coastal Foreshore Reserve (Parks and Recreation).
- Parks and Recreation.
- Rural Community.
- Rural Resource.

360,000 380,000 400,000 420,000

6,520,000

6,500,000

6,480,000

N

Legend

- Wetlands DBCA-019 extract
- Proposed Action Area
- 12 km black cockatoo foraging
- 20 km black cockatoo non-breeding foraging

Scale: 1: 200,000
Original Size: A3
Imagery Source: Esri Imagery
Grid: GDA94 / MGA zone 50 (EPSG:28350)
0 5 10 km

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Portion of Sublease 5 Area

Figure 18

Wetland Locations within 12 and 20 km of the Proposed Action Area

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4.2 FOREST RED-TAILED BLACK COCKATOOS

While the Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*) is increasingly being recorded within the Perth metropolitan area, including within the City of Wanneroo and Nowergup (Bamford, *Pers. Comm.,* 2022), to date, it has not been observed directly within the Proposed Action Area (Randazzo, 2022). The absence of preferred foraging species such as the Jarrah (*E. marginata*), Marri (*Corymbia calophylla*) and *Allocasuarina* species suggests that that this species is unlikely to be present within the PAA, and on the off chance it does visit the Site, then any impact to the FRTBC is likely to be very low and are more likely to be indirect rather than direct.

Based on the expert opinion of Bamford (*Pers. Comm.,* 2022), it is considered that the Forest Red-tailed Black Cockatoo is very unlikely to utilise the PAA and is not likely to be impacted when the project is implemented, with the following discussion provided for completeness. If present, any impacts to the FRTBC are likely to be much the same as those of the Carnaby's Cockatoo which will be directly impacted by the Proposed Action. Information that is different or additional to the for the Carnaby's Cockatoo is provided in this Section, with information common to both species provided in Section 4.1 and its various subsections.

4.2.1 Potential Impacts

4.2.1.1 Foraging on Site

According to the Department of Agriculture, Water and the Environment (DAWE) (2022) and the Department of the Environment, Water, Heritage, and the Arts (DEWHA) (2009), the FRTBC prefers foraging on seeds of Jarrah (*E. marginata*), Marri (*Corymbia calophylla*) and *Allocasuarina* species, fruit of the Snottygobble (*Persoonia longifolia*), with less important foraging species including Tuart (*E. gomphocephala*), *Hakea* species, and various introduced eucalypts such as River Red Gum (*E. camaldulensis*) and Rose Gum (*E. grandis*). The survey carried out by PGV Environmental (2021) in 2020 recorded only *Banksia sessilis*, *Hakea prostrata* and *Hakea trifurcata* within the Sublease 5 area. No evidence of foraging that can be attributed to the FRTBC was noted by PGV Environmental (2021), and it has not been recorded in the area (Bamford *Pers. Comm.,* 2022).

Both the *Hakea prostrata* and the *Hakea trifurcata* have a growth habit ranging from 1 – 1.5 m up to about 3 m. Within the Proposed Action Area, the dominant species are *B. sessilis* (growth habit to 1.9 m) and *Xanthorrhoea preissii*, with these being the most obvious from the drone images and photographs taken during the November 2022 site visit by Landform Research (Figures 11 and 15). The density of these two species provides a dense vegetative layer that is likely to limit the growth habit of the Hakea's, keeping them low; note also that PGV Environmental (2021) reported that the tallest tree/shrub on site was the *B. sessilis* at around 1.9 m.

Thus, while Hakea is present within the Proposed Action Area, it is:

- Less dominant than the *Banksia sessilis* and the *X. preissii*.
- A lesser preferred foraging species for the FRTBC (DAWE, 2022; Bamford *Pers. Comm.,* 2022).

The absence of preferred foraging species within the Proposed Action Area and the limited presence of *Hakea* sp. strongly suggests that the site would not be a preferred foraging location for the FRTBC, with other sites that provide a better range of food sources being favoured. Accordingly, impacts to the FRTBC associated with the loss of foraging habitat are unlikely.

4.2.1.2 Breeding and Roosting

As per Section 4.1.1.5, the absence of taller trees such as Jarrah (*E. marginata*), Tuart (*E. gomphocephala*), and Marri (*C. calophylla*) (Figures 11 and 15) means there are no trees of suitable species or size that could be utilised by the FRTBC for breeding or roosting. Accordingly, there will no impacts to FRTBC breeding or roosting.

4.3 ADDITIONAL INFORMATION

4.3.1 Impact Nature

The nature of the impacts to the Carnaby's Cockatoo include:

- Loss of 6.495 ha of foraging habitat for the duration of the limestone extraction period, expected to be 10 – 20 years, following which the site will be revegetated to habitat of similar condition to the pre-development condition that is suitable for foraging.
- The potential for bird strike during clearing activities; expected to be during clearing activities only, thus a maximum period of around four weeks.
- Dust generation during clearing activities, thus a maximum period of around four weeks; note that operational dust generation will be managed in accordance with current practices and the approved CEMP.

The loss of foraging habitat will be managed through the application of an offset requirement as a component of the approvals process with the area to be confirmed during the assessment process, with the potential for bird strike managed in accordance with the CEMP that will be approved by DCCEEW as a project approval condition.

4.3.1.1 Risk Assessment

Clearing activities will result in impacts to MNES, namely the Carnaby's Cockatoo. A risk assessment process consistent with *AS ISO 31000:2018* (Standards Australia, 2018) was carried out to address the likelihood and consequences of those impacts based on the information provided in the Preliminary Documentation, including Sections 3.1.7, 3.1.8.1, and 4.1. The risk assessment included consideration of the nature and scale of the likely impacts, along with the level of confidence relating to the prediction of impacts. Note that as per Sections 4.2 (Forest Red-tailed Black Cockatoo) 4.5 (Baudin's Cockatoo), 4.6 (*Melaleuca* sp. Wanneroo), and 4.7 (*Eucalyptus argutifolia*), there is no risk of impacts to other MNES identified by DCCEEW in the RFI document and have not been considered in the risk assessment process.

While the outcomes of the risk assessment indicates that the Proposed Action poses an overall high residual risk in relation to the direct loss of Carnaby's Cockatoo foraging habitat, with a low residual risk in relation to other aspects of their presence.

The definition of likelihood and consequence definitions, and impact assessment matrix are provided in Tables 9, 10, and 11 respectively. The assessment outcome, including the raw and residual risk assessment and ranking, was carried out after considering the results of site visits, undertaking various desktop, and assessment outcomes of surveys carried out by other consultants to quantify where possible (e.g.: area to be cleared) or otherwise qualitatively assess likely impacts based on the available data (e.g.: impacts to fauna species). Outcomes of the risk assessment process are provided in Table 12.

Table 9: Likelihood Definitions

Likelihood	Definition
Rare	May occur in exceptional circumstances
Unlikely	Could occur during the construction period but considered to be unlikely
Possible	Might occur during the construction period
Likely	Will probably occur during the construction period
Almost Certain	Is expected to occur during the construction period

Table 10: Consequence definitions

Consequence	Definition
Minor	Minor environmental impact that can be reversed
Moderate	Isolated by substantial environmental impact that could be reversed with intensive efforts
High	Substantial environmental impact that could be reversed with intensive efforts
Major	Major loss of environmental value with real possibility that it could continue
Critical	Severe widespread loss of environmental value including irrecoverable environmental damage

Table 11: Impact Assessment Matrix

Likelihood	Consequence				
	Minor	**Moderate**	**High**	**Major**	**Critical**
Rare	Low	Low	Low	Medium	High
Unlikely	Low	Low	Medium	High	High
Possible	Low	Medium	Medium	High	Extreme
Likely	Low	Medium	High	High	Extreme
Almost Certain	Medium	High	High	Extreme	Extreme

Table 12: Risk Assessment of the Proposed Action to MNES

Impact	Cause	Nature and/or Scale unknown, unpredictable, or irreversible	Confidence in predictions	Mitigation Measures	Raw Risk			Residual Risk		
					Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Direct loss of 6.495 ha of foraging habitat for the Carnaby's Cockatoo.	Approved clearing of Proposed Action Area.	• Proposed Action Area boundary known. • Irreversible impact due to length of extraction period and expected rehabilitation period.	High level of confidence in predictions.	• Delineation of clearing boundary. • Clearing of entire PAA will occur prior to extraction commencing due to the extraction method that will be implemented. • Offset site identified and secured. • Offset Management Plan prepared	Almost certain	High	High	Almost certain	High	High (offset will be implemented)
Loss of more than 6.495 ha of foraging habitat for Carnaby's Cockatoo.	Unauthorised clearing beyond delineated Proposed Action Area.	• The scale of the impact is unpredictable as it is related to unauthorised clearing. • If it occurs, it is likely to be around the perimeter of the PAA and limited in its location and extent.	High level of confidence in predictions. Moderate level of confidence in the prediction of the scale of impacts.	• CEMP prepared. • Delineation of the clearing boundary. • Pre-construction inspection of the clearing area and associated delineation of the clearing boundary. • Clearing of the PAA will occur via the existing and proposed access track to the north, generally working towards the southern extent. • Rehabilitation of cleared area.	Possible	Moderate	Medium	Unlikely	Moderate	Low
Injury or death of Carnaby's Cockatoo.	Collision with vehicle, plant, or equipment during clearing.	• The nature of the impact is known in the sense that the PAA is within known Carnaby's Cockatoo foraging habitat, but unpredictable as it relates to vehicles, plant, or equipment coming into direct contact with birds. • Impact is likely to be to an individual or small number of birds rather than a flock.	High level of confidence in predictions and likely scale of impacts.	• CEMP prepared. • Use of a fauna spotter to confirm locations of cockatoos ahead of vehicles, plant and equipment entering the PAA prior to clearing. • Allow birds to move on of their own accord. • Avoid clearing in areas where cockatoos are present, allowing them to move away on their own. • Clearing will occur in a general north – south directions, moving from cleared areas into uncleared areas. • Speed limit of no more than 20 km/h within the PAA and access tracks will be applied. • CEMP will include list of wildlife rescue organisations/vets. • Reporting via daily/weekly checklist. • Inappropriate interactions with birds will be recorded as an environmental incident, investigated, recorded, and reported in accordance with organisational and DCCEEW approval conditions.	Possible	Moderate	Medium	Unlikely	Moderate	Low

Impact	Cause	Nature and/or Scale unknown, unpredictable, or irreversible	Confidence in predictions	Mitigation Measures	Raw Risk			Residual Risk		
					Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Dust	Vehicle movement, high winds	• The nature of the impact is known in that dust is likely when the clearing of vegetation is complete. • Impact is likely to be consistent with existing extraction activities in other sublease areas.	High level of confidence in predictions and likely scale of impacts.	• Vegetation clearing and topsoil removal will only be undertaken on days of conducive wind strength and conditions to ensure windblown dust is minimised. • Vegetation clearing and ground disturbance will occur over a maximum 4-week period. • Topsoil stockpiles will be no greater than 4 m in height. • A vehicle speed limit of 20 km/h will be implemented across the site. • A water cart with a capacity greater than 10,000 L will be available when required and will undertake preventative watering of access tracks and working areas when required. • Reporting via daily checklist.	Almost certain	Minor	Medium	Likely	Minor	Low
Noise	Operation of plant and equipment	• The nature of the impact is known in that noise is likely during clearing operations. • Impact will be limited to a known quarry location with no sensitive neighbours close by.	High level of confidence in predictions and likely scale of impacts.	• Operational hours will be limited to between 7 am and 6 pm Monday to Friday, and 7 am to 1 pm on Saturday. • All vehicles and machinery on site will be regularly serviced to maintain good operating condition and minimise unnecessary noise. • The importance of minimising noise on site will be communicated to all personnel and contractors. • If noise complaints are received, these will be investigated promptly. • Site personnel will monitor noise generation on an ongoing basis and if unusually high noise levels are observed, these will be proactively investigated and rectified. • Reporting via daily checklist.	Almost certain	Minor	Medium	Likely	Minor	Low
Weed encroachment	Vehicle and personnel movement, bird and animal droppings	• The nature of the impact is known in the that weed movement vectors are well understood. • Weed establishment within the broader site is likely to be limited to already disturbed areas, with establishment within the cleared area prior to quarrying commencing unlikely given the short time frame that will occur between clearing and extraction commencing	High level of confidence in predictions and likely scale of impacts.	• All vehicles will be clean on entry. • A dedicated sweep out station will be provided where any seeds and/or dirt on vehicles that could harbour seeds can be removed by manual or other appropriate means and disposed of appropriately to landfill. • Where possible, plant and equipment and other vehicles should remain within the clearing area to minimise the risk of spreading weeds. • If appropriate, unwanted or unnecessary access to vegetated areas will be discouraged through track signage and education. • Weed affected topsoils may need to be taken offsite or buried by 500 mm soil/overburden. • If required, declared weeds should be treated promptly by digging out or spraying. • Reporting via daily checklist.	Unlikely	Minor	Low	Rare	Minor	Low

Impact	Cause	Nature and/or Scale unknown, unpredictable, or irreversible	Confidence in predictions	Mitigation Measures	Raw Risk			Residual Risk		
					Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Introduction of plant pathogens	Vehicle and personnel movement	• The nature of the impact is known in the that weed movement vectors are well understood. • The limestone presence is known to inhibit the proliferation of *Phytophthora cinnamomi*.	High level of confidence in predictions and likely scale of impacts.	• All plant and equipment will be clean on entry, with any soil removed prior to entering the site and disposed of to landfill. • Where possible, plant and equipment and other vehicles should remain within the clearing area to minimise the risk of spreading disease. • Inform personnel that dieback may be spread into a location through the movement of infected soil, particularly moist or wet soil, on plant, equipment, vehicles, and footwear. • Entry to and exit from the PAA will be limited to the nominated access track only. • Existing and new personnel will be informed of dieback prevention measures through the induction process. • Signage regarding unauthorised entry and 'clean on entry' requirements will be placed at the overall site entry. • Vegetation and topsoil will be removed and stockpiled in accordance with the provision of the Mine Closure Plan (Landform Research, 2020), and the subsequent movement of vehicles and machinery will be limited to the areas that are cleared of vegetation. • Reporting via daily checklist.	Unlikely	Minor	Low	Rare	Minor	Low
Fires associated with clearing activities.	Sparks from vehicles, discarded cigarettes, or similar igniting dry vegetation, such as weeds.	• The nature of the impact is known in that vegetation on the Swan Coastal Plain are known to benefit from regular fires at a suitable frequency, with fire being an aspect of flora species including but not limited to *Banksia*, Grasstrees, and *Hakea*. • The scale of the impact is unpredictable as it depends on the fire fuel load, moisture, humidity, winds, the length of time since the previous fire, and the season when the clearing will occur. • In the event of unfavourable events during warmer months of the year, the impact could be widespread and extend beyond the M70/138 tenement boundary.	Moderate to high level of confidence in predictions and likely scale of impacts.	• CEMP prepared • Water truck present on site for dust and fire suppression. • Vehicles are fitted by fire extinguishers. • Vehicles restricted to cleared areas unless directly involved with clearing works. • Vegetation immediately adjacent to the PAA is dense with few weeds present, thus the likelihood of ignition is lower than in weedier areas to the west and outside the M70/138 boundaries. • Fire danger ratings will be checked and observed if clearing occurs in warmer months, particularly those associated with Total Fire Bans, Extreme and Catastrophic fire rating days.	Possible	Moderate	Medium	Rare	Moderate	Low

4.3.1.2 Funding Arrangements

The implementation of all management commitments will be the responsibility of the Proponent, Meteor Stone.

4.3.1.3 Roles and Responsibilities

The overarching responsibility for implementing the requirements of the various environmental approval documents including this Preliminary Document and the Construction Environmental Management Plan, will rest with the Meteor Stone Managing Director, with the Quarry Manager responsible for overseeing the day-to-day site environment management activities, as described in the CEMP.

4.3.2 Indications of Additional Relevant Information

In addition to the various policies, guidelines, and other relevant documents (e.g.: Department of Parks and Wildlife, 2013; Department of Agriculture, Water and the Environment, 2022), contact was made with Dr Mike Bamford (2022) from Bamford Consulting Ecologists, a recognised expert in relation to the ecology and habitat requirements of the Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest Red-tailed Black Cockatoo. Dr Bamford provided additional information relating to distribution and preferred foraging species for the various black cockatoos, which informed the assessment of where each was likely to be found based on foraging species present in a particular locale.

4.4 AVOIDANCE AND MITIGATION — CARNABY'S COCKATOO

4.4.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been developed that outlines how Meteor Stone will ensure the clearing activities will be managed to ensure foraging impacts to the Carnaby's Cockatoo will be kept to a minimum (5.3.2, Appendix 1). As the Proposed Action Area does not include tree species suitable for roosting and/or nesting by the Carnaby's Cockatoo, they will not need to be managed during clearing activities. Similarly, as there are no other MNES within 100 m of the Proposed Action Area, the use of the site by Carnaby's Cockatoos during foraging will be the only aspect that will need to be actively managed during the clearing activities. As indicated in Section 2.1 Proposed Action Components, the clearing will occur over the entire Proposed Action Area due to the nature of the extraction method that will be applied, thus potential impacts will occur over a maximum four-week period.

Management activities that will be applied during the clearing phase of the operation will include:

- As a mobile species, the cockatoos are expected to move on from an area as machinery and equipment travel closer to their location.
- The use of a qualified fauna spotter during clearing activities to inform where clearing activities can progress in a particular location.
- Checking for the presence of Carnaby's Cockatoos foraging within the proposed clearing area.
- Avoid clearing in portions of the site where foraging is actively occurring, allowing the flock to move on when ready and without intervention.
- Use nominated access tracks when entering/leaving the site during construction works.
- Vehicles and equipment being clean on entry to minimise the likelihood of weeds and/or dieback.
- Internal tracks will be constructed of crushed limestone, thus continuing to mitigate against the potential for infection by *Phytophthora cinnamomi*.

The CEMP is provided in Appendix 1.

4.5 BAUDIN'S COCKATOO

A review of the modelled distribution for the Baudin's Cockatoo included as Map 2 in the DAWE 2022 referral guidelines indicates the Proposed Action Area is located:

- Outside the area where the species is likely to occur — it is further east and south of proposed clearing area.
- North and west of the indicated foraging areas.
- North and west of the indicated main wintering area.
- Well north of the known and predicted breeding areas.

Information provided by Dr Mike Bamford (*Pers. Comm.,* 2022) has indicated that based on his experience, the Baudin's Cockatoo:

- Has been recorded in the hills east of Perth, as far north as Mundaring, or thereabouts.
- They do come into the eastern portion of the Swan Coastal Plain to Neaves Road Bullsbrook approx. 18 km to the east, Whiteman Park approx. 26 km to the southeast, and the Perth Airport approx. 38 km to the south of the Proposed Action Area.
- Their main observed foraging species are Marri and apples.

A review of the DBCA threatened and priority listed fauna database (DBCA, 2022f) indicates that the closest Baudin's Cockatoo 2009 record is approximately 9 km to the south, with this record appearing to be the one referred to in the GHD (2014) *Cockburn Cement Ltd Nowergup Tenements Flora and Fauna Assessment Report*. Given the similarity in the look of Baudin's and Carnaby's Cockatoos (Figure 19), along with there being a single record from approximately 14 years ago combined with the professional experience of Dr Bamford, the possibility of a misidentification or a data entry issue at the time of reporting cannot be ruled out.

Figure 19: Baudin's Cockatoo (L) and Carnaby's Cockatoo (R)

Source: Brand, 2019 and 2023 (Pers. Comm.)

It is acknowledged that there is habitat within the 12-km breeding zone and the 20-km non-breeding foraging zone around the Proposed Action Area that could be utilised by the Baudin's Cockatoo. However, based on the combination of the above data sources, along with a lack of its preferred foraging species, Marri, within the Proposed Action Area, this species is not likely to be present, therefore the clearing of the 6.495 ha to enable limestone extraction is not likely to result in direct or indirect impacts to the Baudin's Cockatoo.

4.6 *MELALEUCA* SP. WANNEROO

4.6.1 Description

Keighery (2017) indicates that:

- *Melaleuca* sp. Wanneroo is a localised taxon of the *Melaleuca systena* complex, as revised.
- It is an erect shrub that can grow to 2.5 m tall and 2 – 3 m wide, produces yellow flowers from November – December after *Melaleuca systena* (yellow-cream flowers from August to December) has completed flowering (Figure 20).
- It is described as having hairy leaves that are 15 – 20 mm long, 3 mm wide, a blunt-acute apex, a flat cross-section, and oil glands that are not prominent. It is often associated with the presence of shallow soils over limestone outcrops.
- It has a range restricted to the Nowergup locality, including within the broader M70/138 mining tenement area.

Figure 20: *Melaleuca* sp. Wanneroo (L) and *Melaleuca systena* (R)

Sources: L) Keighery, 2017, R) DBCA, 2024

4.6.2 Baseline Data

The following surveys have been carried out within the M70/138 mining tenement to support the listing of the species as a threatened species (Keighery, 2017):

- 'Hopkins West' subpopulation, September, October, and November 2009, 1 plant.
- 'Hopkins North' subpopulation, November 2013, 46 plants.

Other surveys carried out targeting the *Melaleuca* sp. Wanneroo within the vicinity of M70/138 include:

- GHD 2013 (2014) — 1 plant within the southern portion of their survey location in what is now Sublease 1 operated by Meteor Stone; this plant was cleared around 2015 prior to it being listed as a threatened species (PGV Environmental, 2021).

- PGV Environmental (2021) — no plants.
- Unknown surveyor, probably Keighery (DBCA), May 2017, (Threatened Species Scientific Committee, 2019a).
- Unknown surveyor, April 2008, (Threatened Species Scientific Committee, 2019a).

4.6.3 Likely Impacts

As the closest record of individuals or populations of *Melaleuca* sp. Wanneroo is more than 300 m to the northeast of the PAA, with none recorded within the M70/138 tenement boundary and five recorded within 3 km (Figure 10) DBCA, 2022c), the likelihood of impacts to this species is very low. Accordingly, there is likely to be no impacts to *Melaleuca* sp. Wanneroo individuals or populations because:

- One recorded individual or population is located a minimum of 200 m east of the entry way into M70/138 from Wesco Road and more than 350 m north of the planned access way that represents the westernmost point of the PAA; note that two individual plants indicated with the Sublease 1 and Sublease 3 areas were cleared prior to the Species being listed as threatened (Landform Research, 2020).
- Other populations are more than 800 m to the north and south of M70/138.
- Salinity associated with the clearing of the PAA is not likely to result in salinisation and groundwater will be a minimum of 20 m below the final extraction level (Landform Research, 2020).
- Nutrient cycling is a function of the current ecosystems that include a range of flora and fauna species that make up a self-sustaining ecological community, with no project activities planned within 300 m of the closest individuals or populations.
- Soils associated with the presence of the *Melaleuca* sp. Wanneroo will remain undisturbed as project activities will not occur within 300 m of the closest individuals or populations.
- Groundwater and nutrient transport will be undisturbed as extraction activities will cease at least 20 m above the groundwater table, with plant and equipment consistent with that currently being used in the Sublease 1 area (Landform Research, 2020).
- Remnant vegetation present outside M70/138 is expected to remain in the vicinity of known populations as it is located more than 200 m from the PAA.
- Known *Melaleuca* sp. Wanneroo populations as flora species listed as being associated with this species (Keighery, 2017) are present within M70/138 (PGV Environmental, 2021) and the surrounding area (DBCA, 2022c; DBCA, 2024), it is expected that pollinators will be able to move between populations located within 3 km of the PAA.
- Dust and vibration will be consistent with current extraction activities and land use taking place closer to the *Melaleuca* sp. Wanneroo populations.
- The introduction of dieback and/or weeds into areas where the *Melaleuca* sp. Wanneroo is located is unlikely as traffic movement will be via the existing entry way from Wesco Rd using a limestone track that inhibits the spread of Dieback, the use of the existing, paved, road network to travel to/from the Site, and the requirement for vehicles to be clean when leaving their base as documented in the CEMP (MBS Environmental, 2024a).

4.6.4 Avoidance and Mitigation

While avoidance or mitigation activities are unlikely to be required as several surveys have indicated that the closest known *Melaleuca* sp. Wanneroo is more than 300 m from the Proposed Action Area boundary with several potential dust sources closer to populations than the PAA (Figure 10; DBCA, 2022c), the following will be implemented as a precautionary measure:

- If wind is blowing from the south and it likely to carry dust towards the population that occurs to the northwest of M70/138, dust management measures outlined in the CEMP (MBS Environmental, 2024a) will be implemented.
- If any plants are found within the PAA during clearing activities, they will be retained where possible to do so. If retention is not possible, the loss of plant(s) will be reported to DCCEEW and implications of its presence and/or loss evaluated in consultation with DCCEEW.

4.7 *EUCALYPTUS ARGUTIFOLIA* (YANCHEP MALLEE)

4.7.1 Description

According to French and Nicolle (2019) and DBCA (2023), *Eucalyptus argutifolia* (Yanchep Mallee) (Figure 21) is described as:

- A multi-stemmed mallee that grows from lignotubers or through resprouting.
- Having a smooth bark.
- Typically produces white flowers between March and April.
- Bud caps are rounded, smooth, or with slight grooves radiating from the top.
- Fruits are usually cup-shaped to cylinder shaped.
- Usually grows in shallow soils over limestone, or on slopes and in gullies of limestone ridges or outcrops.
- A distinctive species in its occurrence area and is unlikely to be confused with other species.

Figure 21: *Eucalyptus argutifolia* (Yanchep Mallee)

Source: Florabase, DBCA 2023

4.7.2 Baseline Data

Surveys carried out by GHD (2014) and PGV Environmental (2021) did not record the presence of any individuals or populations of *Eucalyptus argutifolia* (Yanchep Mallee) within the Proposed Action Area or the wider M70/138 tenement boundary. The closest records of this species are more than 200 m to the west, 600 m to the north, and 400 m to the southwest (DBCA, 2022c). Given the distinctive nature of this species, it is readily recognisable outside its flowering period and thus there is a high likelihood that it would have been recorded during survey activities if it was present.

4.7.3 Likely Impacts

As the *Eucalyptus argutifolia* (Yanchep Mallee) has not been recorded within the Proposed Action Area or the broader M70/138 tenement boundary, direct and indirect impacts are very unlikely. As the closest record of individuals or populations of *Eucalyptus argutifolia* is more than 200 m to the northeast of the PAA, with none recorded within the M70/138 tenement boundary and four recorded within 3 km (Figure 10) DBCA, 2022c), the likelihood of impacts to this species is very low. Accordingly, there is likely to be no impacts to *Eucalyptus argutifolia* individuals or populations because:

- One recorded individual or population is located a minimum of 400 m east of the entry way into M70/138 from Wesco Road and more than 200 m north of the planned access way that represents the western-most point of the PAA.
- Other populations are more than 400 m to the north and southeast of M70/138, with an additional population more than 6,000 m to the southwest.
- Salinity associated with the clearing of the PAA is not likely to result in salinisation and groundwater will be a minimum of 20 m below the final extraction level (Landform Research, 2020).
- Nutrient cycling is a function of the current ecosystems that include a range of flora and fauna species that make up a self-sustaining ecological community, with no project activities planned within 200 m of the closest individuals or populations.
- Soils associated with the presence of the *Eucalyptus argutifolia* will remain undisturbed as project activities will not occur within 200 m of the closest individuals or populations.
- Groundwater and nutrient transport will be undisturbed as extraction activities will cease at least 20 m above the groundwater table, with plant and equipment consistent with that currently being used in the Sublease 1 area (Landform Research, 2020).
- Remnant vegetation present outside M70/138 is expected to remain in the vicinity of known populations as it is located more than 200 m from the PAA.
- Known *Melaleuca* sp. Wanneroo populations as flora species listed as being associated with this species (Keighery, 2017) are present within M70/138 (PGV Environmental, 2021) and the surrounding area (DBCA, 2022c; DBCA, 2024), it is expected that pollinators will be able to move between populations located within 3 km of the PAA.
- Dust and vibration will be consistent with current extraction activities and land use taking place closer to the *Eucalyptus argutifolia* populations.
- The introduction of dieback and/or weeds into areas where the *Eucalyptus argutifolia* is located is unlikely as traffic movement will be via the existing entry way from Wesco Rd using a limestone track that inhibits the spread of Dieback, the use of the existing, paved, road network to travel to/from the Site, and the requirement for vehicles to be clean when leaving their base as documented in the CEMP (MBS Environmental, 2024a).

4.7.4 Avoidance and Mitigation

While avoidance or mitigation activities are unlikely to be required as several surveys have indicated that the closest known *Eucalyptus argutifolia* is more than 200 m from the Proposed Action Area boundary (Figure 10; DBCA, 2022c), the following will be implemented as a precautionary measure in the event it is located during clearing of the PAA:

- If wind is blowing from the south and it likely to carry dust towards the population that occurs to the northwest of M70/138, dust management measures outlined in the CEMP (MBS Environmental, 2024a) will be implemented.
- If any plants are found within the PAA during clearing activities, they will be retained where possible to do so. If retention is not possible, the loss of plant(s) will be reported to DCCEEW and implications of its presence and/or loss evaluated in consultation with DCCEEW.

5. AVOIDANCE AND MITIGATION MEASURES

This Section provides information relating to the avoidance and mitigation measures relating to the identified species and communities that may be directly or indirectly impacted by the proposed expansion of limestone extraction activities.

5.1 IMPACT SUMMARY

Based on the information provided in this document:

- The proposed clearing area is of value as a Carnaby's Cockatoo foraging site only as there are no tall trees such as Jarrah, Marri, and/or Tuart that could provide a nesting or roosting location.
- There will be no impacts to any potential or known nesting tree as none are present.
- There will be no impact to any potential or known roosting tree as none are present.
- The vegetation type present is consistent with FCT 24 Northern Spearwood Shrublands and Woodlands, with the dominant species being *Banksia sessilis* (Parrot Bush); this vegetation type is not listed as MNES under the EPBC Act.
- The proteaceous species present within the site favour feeding by the Carnaby's Cockatoo rather than the Baudin's Cockatoo or the Forest Red-tailed Black Cockatoo, suggesting it is likely to be the primary black cockatoo species impacted by the proposed clearing.
- The proposed clearing of 6.495 ha Carnaby's Cockatoo foraging habitat represents the temporary but lengthy loss (or the loss of habitat for the duration of extraction operations) of 0.021% of foraging habitat within the 12-km zone, 0.015% within the 12 – 20-km zone, and 0.009% over the entire 20-km zone.
- At the conclusion of extraction activities, the site will be restored using species derived from those identified by PGV Environmental (2021) during their survey activities and will include preferred Carnaby's Cockatoo foraging species as identified in that document.
- A rehabilitation management plan will be prepared up to two years prior to completion of the extraction activities to ensure it can be reviewed and approved and can be implemented as soon as possible after the cessation of quarrying works. The rehabilitation plan will be consistent with the current version of the Mine Closure Plan, restoring species consistent with those currently present on site as well as drawing on best practice rehabilitation techniques that have been developed during the extraction phase of the operation.
- As the FCT is dominated by *Banksia sessilis* with no tall trees, the time required from the commencement of rehabilitation to the creation of a self-sustaining vegetation community will be significantly less than that required to restore taller species that could develop suitable nesting hollows in the longer term, with a timeframe on the order of 5 – 10 years whereas the time required for trees such as Jarrah, Marri, and Tuart to reach maturity and produce hollows for nesting can be at least 70 – 100 years. *Banksia sessilis* is recognised as being a fast-growing plant due to its method of phosphorous synthesis in comparison to *Banksia attenuata*, for example (Raven, 2021). In addition, Burrows, Wardell-Johnson, and Ward, (2008) investigated the post-fire juvenile period of a range of plants in the southwest of Western Australia and determined that *Banksia sessilis* took 48 months to flower, with no data available to indicate the period until maximum flowering. It is reasonable to infer that the time to produce flowers on juvenile plants that have not been subject to fire is similar.

5.2 AVOIDANCE

The Proposed Action Area avoids:

- The clearing of a minimum of 8 ha of FCT24 and Carnaby's Cockatoo foraging habitat surrounding the Proposed Action Area within the Sublease 5 area of Lot 12737, at least in the short to medium term.
  - Sublease 5 has been made available to Meteor Stone to expand their extraction site, with their plans limited to extracting limestone from the PAA, or 6.495 ha rather than 15 ha, and which is expected to provide a suitable resource base for the next 10 – 20 years.
  - Aerial imagery suggests that a similar vegetation type is present to the south and east of Subleases 4 and 5, indicating that the amount avoided is greater.
  - It is recognised that the tenement area is mapped as a regionally significant raw material (limestone) resource (DMIRS, 2019), with additional areas within the tenement potentially subject to future extraction plans.
  - Landform Research (2022a) has indicated that limestone resources are increasingly becoming unavailable as the land on which they occur is being set aside for conservation purposes, noting that it is uncertain if that is likely to be the case for the resource within M70/138.
  - Any future extraction plans by the tenement holder or its sublease holders will need to undergo a similar, if not more rigorous assessment process, than that which is being applied to the PAA that Meteor Stone plans to extract limestone from, with each application being considered on its merits and taking into consideration knowledge changes relating to species and communities and those that have been listed under the BC Act and/or the EPBC Act since Meteor Stone's referral.
- All known locations of *Eucalyptus argutifolia* (Vu) and *Melaleuca* sp. Wanneroo (En) listed under the BC Act and the EPBC Act within 5 km of the Site, including those known to be present to the north, west and south (DBCA, 2022a).
- Shrublands on Limestone Ridges (Threatened under the BC Act), noting that this ecological community is listed as Critically Endangered under the EPBC Act from November 2023 (DCCEEW, 2023), noting that while the community listing relates to FCT26, FCT24 has been identified within the PAA, with the conservation advice (DCCEEW, 2023) including shrubland areas dominated by *Melaleuca huegelii*, and/or *Melaleuca systena*, and/or *Banksia sessilis*, in contrast the community listing under the BC Act. Based on the conservation advice, the Proposed Action Area may meet the definition of Honeymyrtle Shrubland due to the presence of the *Banksia sessilis*. It is expected that listing will not be applied to this project retrospectively, and on that basis, the closest TEC/PEC dominated by *Melaleuca huegelii – Melaleuca systena* is approximately 390 m to the south of the proposed clearing area (DBCA, 2022e).

5.3 MITIGATION

Two key mitigation measures are planned:

1. The rehabilitation of the quarry site post limestone extraction (Section 5.3.1).
2. The application of various controls relating to the management of activities including bird strike, dust, noise, weeds, and pathogens during the clearing process, noting that the entire project area will be cleared in its entirety shortly after approvals are issued due to the nature of the extraction process that will be applied. These processes will be documented in the approved CEMP (Appendix 1)

5.3.1 Post-Mining Land Use

One of the key mitigation measures that will be adopted for the Proposal is the of the site post limestone extraction, thus 6.495 ha of native vegetation is expected to be restored with a similar type and structure to that presently on site. According to Landform Research (2020), at the conclusion of mining, M70/138 will be returned to native

vegetation, with this expectation applying to the Proposed Action Area in addition to the Sublease 1 area where extraction is nearing completion.

The vegetation type will be similar to that currently present in that it will comprise species associated with the presence of limestone. The species list will be developed from the outcomes of the surveys carried out by PGV Environmental (2021) and GHD (2014). It is recognised that the extraction of limestone from the area will remove most of the resource but will not remove all limestone as the quality will vary according to its position within the landscape.

The planned rehabilitation measures are described in the Mine Closure Plan (MCP) prepared by Landform Research dated 20 October 2020, specifically in Sections 6.0 Post Mining Land Use, 8.0 Closure Outcomes and Completion Criteria. Rehabilitation completion criteria and measurement tools are provided in Table 16, and Section 9.4 Land Restoration and Rehabilitation, with Table 19 indicating that the previous survey reports that will be used to determine suitable species to be used with the revegetation component of the rehabilitation process.

Post-extraction/quarrying rehabilitation activities are long established with provisions for adaptive management if completion criteria are not met for any reason. A site-specific rehabilitation plan that considers the current requirements indicated in the MCP, along with changes in rehabilitation expectations and what is considered best practice to achieve the best outcomes will be prepared and submitted to DCCEEW (or its successor organisation) for review and approval up to two years prior to the cessation of extraction.

At present, the indicative cost of rehabilitation activities is unknown as they will occur a minimum of 10 and up to 20 years post-clearing at the conclusion of limestone extraction activities. A detailed rehabilitation plan will be developed approximately two years prior to the cessation of quarrying and will detail all rehabilitation activities and provide indicative costs for all activities that will be undertaken. Preliminary enquiries with reputable, on-ground native vegetation revegetation specialists, the current indicative cost for activities can be up to $70,000/ha, depending on the activities to be undertaken and the entity carrying them out.

The rehabilitation of vegetation communities is a long-established practice at the conclusion of resource extraction activities and is an expectation. Performance and completion criteria will be established when the rehabilitation management plan is prepared prior to the conclusion of limestone extraction, and is expected to include as a minimum:

- Species list for revegetation, along with diversity and planting density (stems per ha, for example).
- Pre-planting activities, such as ripping of soil, stabilisation of batter slopes, and any pre-planting weed control.
- Rehabilitation methods, including planting of tubestock and seed installation.
- Completion criteria and triggers for action if rehabilitation is not proceeding as expected.
- Biannual monitoring of quadrats, photo monitoring points, and drone footage, including species present (native and non-native), plant diversity and density, presence of bare areas, evidence of pest animal species such as rabbits, and plant health.
- Reporting outcomes as per annual compliance reporting requirements associated with environmental approvals.

While rehabilitation activities are known to be effective, there are potential risks that could impact on their success, such as fire or severe storms. The level of impacts to rehabilitation activities will be related to the timing of the event after installation works. If plants have become established and are mature enough to produce seed (1 – 5 years post installation according to species, with *Banksia sessilis*, for example, known to flower after 4 years (Burrows et al., 2008), then natural response to fire are likely to be effective, assuming the fire is not a hot, destructive fire. After a storm, natural recruitment is more likely to be the rehabilitation mechanism. However, if fire or storms occur during the early stages of the rehabilitation process, then additional infill planting or seed installation may be the more appropriate response. If events such as these occur, they will be discussed with DCCEEW to agree an appropriate way forward.

5.3.2 CEMP

A Construction Environmental Management Plan has been developed that documents how the various clearing and associated activities will be carried out (4.4.1, Appendix 1). It includes procedures that will be followed along with action triggers that will indicate the need to implement a particular course of action, such as the need for dust suppression or weed control, for example. The CEMP will also indicate required monitoring and reporting measures that will be implemented, along with a discussion of the effectiveness of the various avoidance and mitigation measures planned.

The preparation of a CEMP, or similar document, is an accepted industry practice and expectation, and will be submitted to DCCEEW for review and endorsement. For each of the aspects covered in the CEMP, an indication of their effectiveness and confidence of the ability for each measure to reduce the risk or threat will be outlined. For example, the use of a water cart and operating in low-wind conditions are very effective in controlling dust as well as having an on-site fire response mechanism if needed. It is also a common industry practice for vehicles to be clean on entry to site, with the Meteor Stone accessway being crushed limestone, with limestone being known to inhibit infection by *Phytophthora cinnamomi* (DBCA, 2020).

5.4 PRE-CLEARING AND CLEARING PROCEDURES

The key aspects that will need to be managed during the pre-clearing and clearing phases of the action are:

- The loss of the Proposed Action Area as a foraging source by Carnaby's Cockatoos.
- Impacts to surrounding vegetation by dieback and/or invasive plants that may be transported to site on vehicles, plant, and equipment.
- Dust generation to surrounding vegetation.

5.4.1 Carnaby's Cockatoos

Potential impact to Carnaby's Cockatoo during the pre-clearing and clearing phases of the project is likely to be limited to the clearing of the foraging habitat and the potential for bird-strike. The following will be implemented to minimise/mitigate the potential for bird strike:

- Delineation of the clearing area.
- Environmental induction carried out for all personnel involved with the clearing prior to commencement; this will include information relating to Carnaby's Cockatoo and their calls to assist with determining presence during clearing works.
- Visual and aural inspection of the area to be cleared by a fauna spotter prior to vehicle and equipment entering the area.
- It is recognised that the mobility of the birds will mean they will probably move on of their own accord as vehicles come closer; where individuals or flocks are observed, they will be allowed to move away freely before continuing.
- If Carnaby's Cockatoo are injured during operations, depending on the nature and extent of injuries, the animal will be removed to a licenced wildlife carer or vet for assessment and treatment, and records will be kept of injuries and the fate of individuals.

5.4.2 Dieback

While the Proposed Action Area is in a limestone environment that mitigates against the spread of *P. cinnamomi*, one of the most common forms of dieback on the Swan Coastal Plain, all vehicles, plant, and equipment will be:

- Clean on entry to the site.
- Remain on designated tracks and within the defined clearing boundary.

- Where possible, operate in dry conditions only.

5.4.3 Invasive Plants (Weeds)

The likelihood of invasive plants being transported to the PAA is low as plant and equipment that will be used for clearing and operational activities is either currently working within the Sublease 1 area or will travel to and from the site using the existing, sealed, road network within the metropolitan area. Thus, the requirement for vehicles, plant, and equipment to be clean on entry and remain on designated tracks and within the defined clearing boundary will also be effective in minimising the potential for weed spread within the vicinity of the PAA and the broader M70/138 tenement area. In the event weeds become established within the vicinity of the PAA they will be treated using an appropriate methodology according to the type of weed and level of infestation.

5.4.4 Dust

The potential for dust will increase due to the clearing, with deposition on nearby retained vegetation possible. To mitigate against excess dust deposition, the following will be implemented:

- Overburden covered with plant materials will be stored in windrows around the edge of the pit to act as windbreak (Section 2.1).
- A dust cart is present on site for use when required, such as under stronger wind conditions.
- As the extraction process will occur sequentially in layers over the clearing area, the depth of the pit will increase and reduce the potential for continued impacts to nearby vegetation (Figure 8) .

5.4.5 Buffer Areas and Exclusion Zones

The Proposed Action Area includes provision for soil and waste materials generated during clearing to be stored around the perimeter of disturbance area that will act as a barrier between the site and the surrounding area (Figures 1, 2). All locations beyond the PAA will be considered to be an exclusion zone in the same way that has been applied to the currently operational Sublease 1 area (Figure 8). No other buffers or exclusion zones will be required.

5.5 PROPOSED REHABILITATION

At the conclusion of the limestone extraction, the site will be rehabilitated, with the expectation that the restored site will set aside for conservation. The proposed rehabilitation will involve:

- Choosing species based on the outcomes of the flora surveys that will suit the soils present within the area.
- Confirming the planting density and locations according to site conditions, including the presence of sand and limestone, along with the depth to groundwater.
- Final contours and landform will be determined closer to the conclusion of extraction as it will be dependent on the depth to which the limestone has been removed; this is expected to include the battering of the natural land surface to achieve a slope from 1:4 to 1:6.

5.6 PROPONENT COMMITMENTS

The proponent, Meteor Stone, commits to the following:

- Implementing the provisions of the approved CEMP when endorsed by DCCEEW during pre-clearing and clearing activities, including the use of a fauna spotter during clearing operations.
- Proceeding with the purchase of an acceptable offset site that will be a direct, like-for-like offset in terms of the impacts to Carnaby's Cockatoo foraging.

- Undertaking a detailed survey of the proposed offset site in spring 2024 to gather an appropriate level of baseline data.
- Using the offset site baseline data to develop the ongoing management plan that bring about the planned enhancement/nett gain in condition.
- Implementing the provisions of approved offset site management plan when approved by DCCEEW.
- Preparing a site-specific rehabilitation management plan for the Sublease 5 area approximately 2 years prior to the cessation of extraction activities to allow review and approval by DCCEEW (or any successor agency) prior to implementation.
- Implementing the rehabilitation plan at the cessation of extraction activities.
- Undertaking all monitoring, auditing, and reporting in relation to approval conditions, along with the progression of activities specified in the various management plans.

5.7 MANAGEMENT STRATEGIES AND PERFORMANCE TARGETS

Table 13 summarises each of the projected direct and indirect impacts along with their management strategies/controls and performance targets. These performance targets will be used to measure and report on compliance with approval conditions and management commitments.

Table 13: Management Strategies/Controls and Performance Targets

Impacts	Management Strategies/Controls	Performance Targets
Direct Impacts		
Presence of Carnaby's Cockatoos foraging within the PAA.	• Use of a fauna spotter to note presence and location of birds. • Allow birds to move on of their accord, ensuring they are not shepherded or encouraged to move along in any way (refer definition of 'disturb' in the BC Act, particularly (a)(i), (a)(iii) and (a)(iv)). • Clearing will occur in a general north–south direction, along cleared areas into uncleared areas from the access track and then towards the southern extent of proposed action area to minimise potential interactions with birds. • Mobile plant and equipment will comply at all times with the specified internal speed limit of 20 km/h for the PAA. • Reporting via daily checklist. • Inappropriate interactions with birds will be recorded as an environmental incident, investigated, recorded, and reported in accordance with organisational and DCCEEW approval conditions.	• All individual birds or flock of birds will be allowed to move from within the PAA of their own accord. • There will be no intervention by project personnel that intentionally or unintentionally drives, herds, or otherwise 'encourages' birds to move away from the PAA. • All clearing activities are undertaken from a cleared portion of the site . • All vehicles involved with clearing activities will comply with nominated Site speed limits. • Daily checklist completed and recorded. • No recordable or reportable incidents.
Bird strike resulting in injury or death.	• Use of a fauna spotter to note presence and location of birds. • Allow birds to move on of their accord, ensuring they are not shepherded or encouraged to move along in any way (refer definition of 'disturb' of the Biodiversity Conservation Act 2016 (WA) (BC Act), particularly (a)(i), (a)(iii) and (a)(iv). • Clearing will occur in a general north–south direction, along cleared areas into uncleared area from the access track and then towards the southern extent of proposed action area to minimise potential interactions with birds. • Mobile plant and equipment will comply at all times with the specified internal speed limit of 20 km/h for the PAA. • Injured animals will be taken to a nearby native animal rescue partner vet for assessment (CEMP, Section 6, Figures 4, 5, 6). • Dead animals will be disposed of appropriately. • Reporting via daily checklist.	• All individual birds or flock of birds will be allowed to move from within the PAA of their own accord. • There will be no intervention by project personnel that intentionally or unintentionally drives, herds, or otherwise 'encourages' birds to move away from the PAA. • All clearing activities are undertaken from a cleared portion of the Site . • All vehicles involved with clearing activities will comply with nominated Site speed limits. • Daily checklist completed and recorded. • No recordable or reportable incidents.

Impacts	Management Strategies/Controls	Performance Targets
	• Bird strike and death of birds will be recorded as an environmental incident and non-conformance with the CEMP, investigated, recorded, and reported in accordance with organisational and DCCEEW approval conditions.	
Clearing beyond approved boundary.	• Delineating clearing area prior to clearing commencing using flagging tape or other suitable means. • Site Quarry Manager and key personnel walking site daily prior to clearing commencing to review area to be cleared on the day. • Reporting via daily checklist. • Clearing beyond the approved boundary will be considered an environmental incident and non-conformance, investigated, recorded, and reported in accordance with organisational and DCCEEW approval conditions.	• No clearing beyond the approved boundary. • Daily checklist completed and recorded. • No non-conformances relating to clearing.
Indirect Impacts		
Dust.	• Vegetation clearing and topsoil removal will only be undertaken on days of conducive wind strength and conditions to ensure windblown dust is minimised. • Vegetation clearing and ground disturbance will occur over a maximum 4-week period. • Topsoil stockpiles will be no greater than 4 m in height. • A vehicle speed limit of 20 km/h will be implemented across the Site. • A water cart with a capacity greater than 10,000 L will be available when required and will undertake preventative watering of access tracks and working areas when required. • Reporting via daily checklist.	• Dust generated from the PAA does not impact upon Black Cockatoos or their habitat. • Daily checklist completed and recorded. • No recordable or reportable incidents or complaints.
Noise.	• Operational hours will be limited to between 7 am and 6 pm Monday to Friday, and 7 am to 1 pm on Saturday. • All vehicles and machinery on site will be regularly serviced to maintain good operating condition and minimise unnecessary noise. • The importance of minimising noise on site will be communicated to all personnel and contractors. • If noise complaints are received, these will be investigated promptly. • Site personnel will monitor noise generation on an ongoing basis and if unusually high noise levels are observed, these will be proactively investigated and rectified. • Reporting via daily checklist.	• No recordable or reportable incidents or complaints. • Daily checklist completed and recorded. • All vehicles involved with clearing activities will comply with nominated Site speed limits.

Impacts	Management Strategies/Controls	Performance Targets
Weed encroachment.	• All vehicles will be clean on entry. • A dedicated sweep out station will be provided where any seeds and/or dirt on vehicles that could harbour seeds can be removed by manual or other appropriate means and disposed of appropriately to landfill. • Where possible, plant and equipment and other vehicles should remain within the clearing area to minimise the risk of spreading weeds. • If appropriate, unwanted or unnecessary access to vegetated areas will be discouraged through track signage and education. • Weed affected topsoils may need to be taken offsite or buried by 500 mm soil/overburden. • If required, declared weeds should be treated promptly by digging out or spraying. • Reporting via daily checklist.	• All detected declared weeds to be removed. • Daily checklist completed and recorded. • No additional weed load as a result of Proposed Action that will impact on adjoining vegetation.
Introduction of plant pathogens	• All plant and equipment will be clean on entry, with any soil removed prior to entering the site and disposed of to landfill. • Where possible, plant and equipment and other vehicles should remain within the clearing area to minimise the risk of spreading disease. • Inform personnel that dieback may be spread into a location through the movement of infected soil, particularly moist or wet soil, on plant, equipment, vehicles, and footwear. • Entry to and exit from the PAA will be limited to the nominated access track only. • Existing and new personnel will be informed of dieback prevention measures through the induction process. • Signage regarding unauthorised entry and 'clean on entry' requirements will be placed at the overall site entry. • Vegetation and topsoil will be removed and stockpiled in accordance with the provision of the Mine Closure Plan (Landform Research, 2020), and the subsequent movement of vehicles and machinery will be limited to the areas that are cleared of vegetation. • Reporting via daily checklist.	• *Phytophthora* dieback is not introduced to the PAA. • No visible indicators of *Phytophthora* dieback show in the vegetation fringing the PAA. • Daily checklist completed and recorded.

Impacts	Management Strategies/Controls	Performance Targets
Fire	• CEMP prepared. • Water truck present on site for dust and fire suppression. • Vehicles are fitted by fire extinguishers. • Vehicles restricted to cleared areas unless directly involved with clearing works. • Vegetation immediately adjacent to the PAA is dense with few weeds present, thus the likelihood of ignition is lower than in weedier areas to the west and outside the M70/138 boundaries. • Fire danger ratings will be checked and observed if clearing occurs in warmer months, particularly those associated with Total Fire Bans, Extreme and Catastrophic fire rating days. • Recorded via daily checklist.	• No fires caused by pre-operational activities. • Daily checklist completed and recorded.

6. OFFSETS

The longer term but temporary loss of 6.495 ha of quality Carnaby's Cockatoo foraging habitat means that an offset site is required for this project. This section discusses the offset requirement and the proposed offset.

6.1 OFFSET REQUIREMENT

The offset site is required to compensate for significant impacts to Carnaby's Cockatoo foraging habitat. Based on the flora species present with a dominant species being *Banksia sessilis* (Parrot Bush), which is a known preferred foraging species of the Carnaby's Cockatoo (*Zanda latirostris*) (Section 4.1) rather than the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Section 4.2). On this basis, the offset site will offset residual impacts associated with the loss of Carnaby's Cockatoo foraging species only.

It is noted that DCCEEW indicated the potential for impacts to the:

- *Zanda baudinii* (Baudin's Cockatoo).
- *Melaleuca* sp. Wanneroo.
- *Eucalyptus argutifolia* (Yanchep Mallee).

As these species are not present within the Proposed Action Area or within 200 m of the Site (Sections 4.5, 4.6, 4.7), no direct or indirect impacts are expected and thus will not require an offset.

The proposed offset will be the purchase of a [redacted] portion of [redacted].
A conservation covenant will be placed over the entire block, with the area required to offset the Meteor Stone proposed action to be finalised during the assessment process. Any remaining land within [redacted] to be offered to other proponents with the need for an offset. Each proponent with an interest in [redacted] will purchase shares, with the number of shares equating to the area specified for their offset requirement. All parties will contribute to ongoing management requirements as per their various approval conditions on a pro rata basis, according to the area they are 'responsible' for.

6.1.1 EPBC Act Offsets Policy Principles

Table 14 defines these principles (DSEWPaC, 2012a) and provides MBS comments on how the proposed offset meets the requirements.

Table 14: Offset Principles and MBS Comments

No.	Principle	MBS Comment
Suitable offsets must:		
1	Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.	The Offset Assessment Guide and the Black Cockatoo Habitat Quality Score calculators have been used to ensure that the proposed offset site, namely the acquisition of [redacted] of which up to 75 ha (area to be confirmed during the approvals process) of vegetated habitat that will be subject to a conservation covenant that will be placed over the title in perpetuity. In the short to medium term, according to relevant approval conditions, it will be managed by the purchasing entity, thus ensuring enhancement of the site to improve its condition equivalent to the condition of Proposed Action Area, with the expectation that in time it will be ceded to a suitable entity for ongoing management for conservation purposes, such as local government or a stage government entity.

No.	Principle	MBS Comment
2	Be built around direct offsets but may include other compensatory measures.	The proposed offset is a direct offset, with the offset calculator indicating that the proposed site will offset more than 100% of the impact, and thus will meet the >90% Direct offset requirement.
3	Be in proportion to the level of statutory protection that applies to the protected matter.	The outcome will set aside quality Carnaby's Cockatoo foraging habitat, with additional conservation benefits likely to be associated with the preservation of other conservation significant flora and fauna species that are known to be present within 10 km of the proposed offset Site boundary.
4	Be of a size and scale proportionate to the residual impacts on the protected matter.	As per No. 1 – the use of the Offset Assessment Guide, along with reviews of various desktop resources and a survey of [redacted] by Bamford Consulting Ecologists (2024) (Appendix 6) were used to ensure that the proposed offset site is of a size and scale proportionate to the residual impacts associated with the loss of Carnaby's Cockatoo foraging habitat.
5	Effectively account for and manage the risks of the offset not succeeding.	The proposed offset will include a management component for a time agreed with DCCEEW and DEMIRS to mitigate risks of the offset failing.
6	Be additional to what is already required, determined by law, or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action).	Given that State approvals through DEMIRS are also being progressed for the same proposed action and the same matter, it is expected that when the area of the offset has been confirmed during the assessment process, it will also satisfy the offset requirements for both DEMIRS and DCCEEW, without the need for separate sites.
7	Be efficient, effective, timely, transparent, scientifically robust, and reasonable.	The identification of the site within the Shire of Dandaragan has been carried out in association with a consultant that specialises in assisting proponents acquire suitable offset sites. A preliminary visit to the site in December 2023 has confirmed usage by the Carnaby's Cockatoo through aged feeding evidence. This species has also been observed directly by one of the consultants involved with the purchase of the Site. A survey carried out by Bamford Consulting Ecologists (2024) (Appendix 6) in March 2024 confirmed recent Carnaby's Cockatoo foraging, with a feather also being found within Lot. Based on that preliminary visit and other publicly available information, a conditional offer has been made for the land, with the cost and future management costs being incurred annually rather than as a one-off upfront lump sum for a 20-year management period, thus providing a cost-effective option for a small business operator, as well as being suitable, robust, and reasonable in terms of offset impacts associated with the loss of foraging habitat favoured by the Carnaby's Cockatoo. A management plan has been prepared that will outline the various management actions that will enhance the quality of the offset site with the aim of achieving a site that has a similar quality to the area to be cleared. Management actions are expected to include weed control, infill planting, fence maintenance, and potentially rubbish removal and rabbit and fox baiting if required. The management plan will also indicate completion criteria, key performance indicators, action triggers in the event success criteria are not being met, along with annual monitoring and reporting requirements, with the expectation reports will be submitted to DCCEWW and to DEMIRS.

No.	Principle	MBS Comment
8	Have transparent governance arrangements including being able to be readily measured, monitored, audited, and enforced.	One or more permanent conservation covenant will be placed on the title of [redacted] in stages as patches are identified and set aside for offset purposes. State and Commonwealth approval conditions will include a monitoring and annual reporting component indicating progress in terms of improved condition, such as a reduction in the weed presence and success of infill planting. As indicated, an indicative management plan has been prepared for Lot 2 to outlines ongoing management, monitoring and reporting as to the success of management and habitat enhancement activities for an agreed timeframe, anticipated to be 10 years. In time, it is expected that the land will be added to the conservation estate, potentially in favour of local government.
9	Informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty.	The preliminary due diligence visit by MBS Environmental personnel in December 2023 on behalf of Meteor Stone to confirm the presence of habitat and other values relevant to usage by the Carnaby's Cockatoo has informed the [redacted]. A Carnaby's Cockatoo habitat assessment was carried out by Bamford Consulting Ecologists (2024) (Appendix 6) in March 2024 that confirmed the foraging values of Lot 2, utilisation by the Carnaby's Cockatoo, and also provided an indication of additional conservation significant fauna species that are likely to utilise the site and benefit from it being set aside for conservation.
Government Decision Making Relating to Offset Suitability will be:		
10	Informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty.	Relevant information is provided in this document, and particularly Section 6 in relation to the offset site to enable DCCEEW to review and assess the adequacy of this offset proposal.
11	Conducted in a consistent and transparent manner.	

6.2 OFFSET PROPOSAL

Based on the indicated residual impact associated with the clearing of the Proposed Action Area on the Carnaby's Cockatoo (Endangered) through the loss of foraging habitat, an offset that is in keeping with the EPBC Environmental Offsets Policy (DSEWPaC, 2012a) and the Offsets Assessment Guide (DSEWPaC, 2012b) has been identified. The proposed offset also considers current and previous guidance material relating to black cockatoos, and the Carnaby's Cockatoo (DSEWPaC, 2012c and DAWE, 2022). Table 15 outlines the residual impact to these species.

Table 15: Impacts to Carnaby's Cockatoo Values

Value	EBPC Act Status	Quantified Impact
Carnaby's Cockatoo (*Zanda latirostris*) foraging habitat.	Endangered	6.495 ha
Potential black cockatoo nesting and/or roosting trees.	Endangered, Vulnerable	0

It is noted that the:

- Flora species within the Proposed Action Area favours foraging by the Carnaby's Cockatoo rather than the Forest Red-tailed Black Cockatoo, however there are species present that could provide a food source for both.

- While the Forest Red-tailed Black Cockatoo has been recorded within the City of Wanneroo, including in Nowergup, it has not been recorded within the Proposed Action Area (Bamford *Pers. Comm.,* 2022).

The proposed offset for the remaining residual impacts associated with the loss of Carnaby's Cockatoo foraging habitat within the Proposed Action Area involves the purchase of land that will be set aside for conservation purposes in perpetuity through the application of conservation covenant, either through the National Trust or under the *Soil Conservation Act 1945* (WA). The proposed offset will also meet the offset requirements associated with approvals for the same matters issued in the form of clearing permit by the Department of Energy, Mining, Industry Regulation and Safety (DEMIRS). Note that the proposed offset site being purchased is larger than the area required to offset the impacts associated with the current action (2022/09324), and it is the intent of Meteor Stone to preserve the remainder of the site for future offset banking.

6.2.1 Application of the Offsets Guide

The DSEWPaC (2012b) Offsets Guide assists with applying the DSEWPaC (2012a) EPBC Act Offsets Policy. It takes the form of a calculation tool that aids in determining the suitability of a proposed offset strategy, and includes the following parts:

- MNES assessment table.
- Impact calculator.
- Offset calculator.
- Summary box.

In addition, the *How to Use the Offsets Assessment Guide* (DSEWPaC, 2012c) along with consultation with DCCEEW during the preparation of this document has been used to inform the inputs to the Offsets Guide, with the inputs described in Table 16, and outcomes of the process summarised in Table 17.

Table 16: Offset Assessment Guide Descriptors

Guide Component	Input Item	Explanation
MNES Table	MNES matter, e.g.: species or ecological community	Requires: • Name and conservation status of each protected matter. • Completed worksheet for each protected matter. The Guide allows for 'overlapping' offset requirements where multiple species and/or ecological communities are involved.
Impact calculator	Protected matter attributes	Considers the various options used to quantify a suitable offset according to the protected matter's habitat or ecology that will be impacted by proposed action. In this instance, that attribute relates to the loss of Carnaby's Cockatoo foraging habitat rather than breeding and/or roosting habitat.
	Impact description column	Describes the likely impacts of the proposed action on the species and/or ecological community that will be the subject of the offset proposal.
	Impact quantum	Quantifies the extent of the impact; includes consideration of the area (ha, m^2) that will be impacted along with the habitat quality to arrive at a habitat quality score.
	Information source	Documents the information sources used to arrive at the various conclusions, such as flora, vegetation, and fauna survey reports, for example.

Guide Component	Input Item	Explanation
Offset calculator	Protected Matter Attributes	Requires the selection of the matter that is the subject of the proposed action; when selected in both the impact and offset calculators, the total quantum of impact is automatically populated elsewhere in the calculator.
	Offset Description Column	Provides a description and some contextual information about the proposed offset.
	Time Horizon Over Which Loss is Averted	Provides an indication of the time over which the averted loss can be calculated; this is capped at 20 years or the life of an offset.
	Time until Ecological Benefit	Represents the estimated time it will take until the habitat quality improvement of the proposed offset will be realised; those with shorter timeframes until ecological benefit can be valued more highly than those with longer timeframes.
	Offset Start Area and Quality	This is based on the habitat quality assessment that provides an indication of the current area and quality of the proposed offset, and which has been informed by the survey carried out by Bamford Consulting Ecologists (2024) (Appendix 6) and the due diligence visit carried by MBS Environmental in December 2023.
	Risk of Loss (%)	This relates to the risk of loss of the proposed offset area, considering both what could happen if the site is not set aside for conservation through its use as an offset site and with the site being retained for conservation purposes.
	Confidence in Result (%)	The confidence level is expressed as a percentage that represents the level of certainty regarding the success of the proposed offset. Those activities that have a lower risk of failure will have a higher confidence level in the score. The change in habitat quality confidence result considers the likelihood of the proposed change in quality being achieved, while the averted loss relates to the certainty level of the strength and effectiveness of the proposed risk mitigation measures that aim to mitigate against the loss of the site.
	Net Present Value (adjusted hectares)	The net present value of the proposed offset is calculated by considering the annual probability of extinction of the protected matter, the time horizon involved, and the adjusted gain through implementing the offset proposal. Habitat quality improvement and/or averting loss holds greater value for a protected matter than the same benefit realised at a future time.
Summary of Inputs	Summary Box	This incorporates the cost of the direct offset and the percentage of the impact that has been offset to arrive at the cost associated with other compensatory measures.

Source: DSEWPaC, 2012c, MBS Environmental 2023 and 2024.

Table 17: Summary of Offsets Assessment Guide Inputs for Proposed Land Acquisition Offset

Offset Calculator Attribute	Rationale
Quantum of impact – area (ha)	This is the area of the Proposed Action Area, which is the area of proposed clearing of Carnaby's Cockatoo foraging habitat due to the dominant flora species present being the *Banksia sessilis* (Parrot Bush).
Quantum of impact – quality (HQS)	Site assessment activities carried by MBS Environmental that included a visit to the Site and review of survey reports prepared by others determined that the Carnaby's Cockatoo foraging habitat was of high value on the basis of the presence of the *Banksia sessilis*, its density, and its condition.
Time over which loss is averted (year)	The proposed offset is the acquisition of a 136-ha vegetated patch of land, with the vegetation present being dominated by Banksia Woodland, thus the presence of this vegetation will provide an immediate, ongoing benefit to the Carnaby's Cockatoo population in the area. Combined with the placement of a conservation covenant over the site and planned management in accordance with approval conditions will mean an immediate timeframe over which the loss of habitat is averted. The purchase of the site will meet the immediate offset requirement needs of Meteor Stone in the first instance, along with those of other proponents ('shareholders') needing smaller offset sites for any remaining land not required by Meteor Stone. Once the purchase of Lot 2 is finalised, it will be managed by the purchasing entity, with each 'shareholder' being responsible for contributing to original purchase cost and ongoing management costs for the life of the offset in accordance with various approval conditions. In time, it is expected the land will be added to the conservation estate, either at a local or state government level. The conservation covenant will mean an 'immediate' benefit to the Carnaby's Cockatoo as the land will be set aside for conservation in perpetuity.
Time until ecological benefit	As above. As a vegetated site dominated by flora species favoured by the Carnaby's Cockatoo, thus a like-for-like offset in terms of offsetting residual risks associated with the loss of foraging habitat from the PAA. The proposed offset will be set aside for conservation in perpetuity through the placement of a conservation covenant on the title, meaning there will be an immediate and ongoing ecological benefit to the cockatoo population and the retention of a sizable, vegetated area that will provide additional benefits to the broader ecological community and its components, resulting in a nett conservation gain. After the initial management actions and enhancement activities have been complied with in accordance with various environmental approval conditions, the land will be ceded to a suitable authority for ongoing management and protection, either at a state or local government level. Accordingly, there will be an immediate, ongoing benefit to Carnaby's Cockatoo as it will secure this habitat in perpetuity and provide benefit to the regional population in the longer term.
Start quality of the site (scale 1 – 10)	A site visit indicates the site is in good condition with preferred Carnaby's Cockatoo foraging specie, with potential roosting and nesting trees present within close proximity to the site boundary. A seasonal wetland is present in the northern portion of the site that may act as a seasonal water source for the Cockatoos. There are signs of disturbance with a controlled burn having occurred within the past two years and some subsequent weed encroachment, particularly around the perimeter of the site and areas where vegetation density is reduced, as well as indicators of feral cats and foxes being present (MBS 2023 site visit; Bamford Consulting Ecologists, 2024) (Appendix 6). Managing these disturbances will result in enhancement of the foraging values present within Lot 2.

Offset Calculator Attribute	Rationale
Future quality of the site without offset (scale 1 – 10)	At present, there is no ongoing management of the site, with evidence of weed encroachment and tree deaths after the controlled burn that was carried out approximately two years ago. This was confirmed via communication with the land consultant involved with identifying [redacted] as a potential offset site, various communications with the owner via the consultant, and the provision of photographs by the owner that indicated the weeds. The outcomes of these communications informed the due diligence site visit in December 2023. The assessment carried out by Bamford Consulting Ecologists (2024) (Appendix 6) noted the presence of feral cats and foxes that could prove a threat to the presence of other conservation significant fauna species expected to be utilising the site. At the time of writing, [redacted] sale, thus there was the possibility [redacted] for use in accordance with its rural zoning and potentially impacting on its value as foraging habitat as a minimum. The owner has since accepted a conditional offer to purchase a portion of [redacted] for use as an offset site, thus providing some certainty of its future quality.
Future quality of the site with offset (scale 1 – 10)	The DCCEEW expectation is that the offset site has some potential for enhancement, as well as that through active management, the future quality of the site will increase to the same level as that of the Proposed Action Area. Based on the values present within the PAA, its value as Carnaby's Cockatoo foraging habitat is high, thus is considered to be a 10. Accordingly, it is expected that the condition of the offset site will be raised to a ten also. This will be achievable through active management activities such as but not limited to weed control, infill planting, and fence maintenance. Activities will be outlined in the site management plan.
Size of offset area (ha)	The minimum offset area of 25 ha was arrived at using the DCCEEW offset calculator, however, as a precautionary measure to ensure a sufficiently large offset site is acquired, verbal conversations with assessing officers have suggested that Meteor Stone should work on an indicative maximum offset area of 75 ha, with the actual area to be determined during the assessment phase of the approvals process. The proposed offset site is large enough to accommodate this range of offset requirement. It is expected that when Meteor Stone's offset requirement is confirmed, Lot 2 will also act to offset the expected clearing permit approval requirement that will be issued by the Department of Energy, Mines, Industry Regulation and Safety for the same Action and environmental value, or the clearing of 6.495 ha of Carnaby's Cockatoo foraging habitat to undertake the extraction of the limestone resource in the area.
Risk of loss (%) without the offset	The average annual background rate of loss for the Shire of Dandaragan is listed as 0.37% (Maseyk, Evans, and Maron, 2017), The risk of loss is estimated at 1% in the calculator based on the applied value for the area where the offset site is located as well as the potential for continued degradation in the form of an increased weed presence, and the potential for rubbish, for example, being possible through the lack of active management by the current or other owners if the site were purchased for zoned use (primary industry/agriculture) rather than by the proponent and being set aside for conservation.
Risk of loss (%) with the offset	At present, the proponent through the company set up to purchase and management the offset site has submitted an offer to purchase the 136-ha area that will provide the required offset for this action, as well as for other 'shareholders' that will buy into the offset site and share the purchase and ongoing management costs. On acquisition, the managing entity will be responsible for managing the site on behalf of each of the proponents until agreed completion criteria and ongoing management responsibilities have been fulfilled in accordance with the relevant approval conditions. In time, the site will be ceded to a suitable state or local government entity for ongoing management as a conservation reserve to provide on ongoing benefit to the protection of Carnaby's Cockatoo species as well as provide additional ecological benefits to other species that make up the ecological community in the area.

Offset Calculator Attribute	Rationale
Confidence in result – averted loss (%)	Despite the intent that the site will be admitted to the conservation estate and provide Carnaby's Cockatoo habitat on an ongoing basis, there are other reasons for 'failure', such as fire or damage from storm events that could compromise the site and its use by Carnaby's Cockatoo. Thus, while revegetation and restoration within Banksia Woodland areas is well understood through research activities that have been carried out by various organisations, the confidence in the outcome of the process cannot be 100%.
Confidence in result – change in habitat quality (%)	The proposed offset site is in Very Good condition with some evidence of degradation/threatening processes, such as a low level of weed infestation and small patches that would benefit from infill planting, for example, and which are readily managed. In addition, the land acquisition process will include a maintenance component for a time to be determined in consultation with regulators/key stakeholders including DCCEEW and DEMIRS.
Percentage (%) of impact offset	Based on the DCCEEW Offset calculator outputs, the proposed offset compensates for more than 100% of the impact associated with the clearing of 6.495 ha of Carnaby's Cockatoo foraging habitat.

6.2.2 Habitat Quality Score — Proposed Offset Site

The result is a habitat score that provides an indication of how well a particular site supports a specific species or ecological community and contributes to its ongoing viability. The habitat score is calculated for both the Proposed Action Area and the proposed offset site, with the score feeding into the impact and offsets calculators.

For black cockatoo species, the calculation of the habitat quality score revolves around:

- Determining the site condition based of the community or species through considering characteristics such as vegetation condition and structure based on a series of metrics according to the species of interest.
- Consideration of the site context, such as proximity to known breeding and/or foraging habitat for the species of interest.
- Consideration of the species stocking rate via observation records and/or evidence of foraging.

The assessment of the Proposed Action Area Carnaby's Cockatoo habitat carried out by MBS Environmental resulted in a habitat quality score of 10 based on the presence of Banksia Woodland dominated by *Banksia sessilis* (Parrot Bush), a preferred Carnaby's Cockatoo foraging species in Excellent condition, the proximity of additional foraging locations nearby, with confirmation of the presence of Carnaby's Cockatoo confirmed through direct observation during the November 2022 site visit by MBS Environmental and DEMIRS personnel.

Bamford Consulting Ecologists (2024) (Appendix 6) carried out an assessment of the Carnaby's Cockatoo habitat at the Proposed Offset Site in March 2024 and determined that foraging value of the site ranged from 3 in the wetland area (Melaleuca Dampland, 11% of the Site) and 7 – 8 in the remainder of the Site. The assessment based on the reduced canopy cover of the vegetation present, recovery from a controlled burn in the past 2 – 3 years, and the evidence of degradation in the form of an increased weed presence and some dead trees. The presence of Carnaby's Cockatoo utilisation of the site was confirmed by Bamford Consulting Ecologists (2024), and MBS environmental personnel through direct observation of feeding debris during their 2023 due diligence visit.

6.3 PROPOSED OFFSET METHOD

The proposed offset method to counterbalance the loss of 6.495 ha quality Carnaby's Cockatoo foraging habitat is the purchase (land acquisition) of [redacted] of land, of which an expected minimum requirement for the Proponent will be 27.5 ha as calculated using the Offsets Calculator, with the final area of the offset to be confirmed during the assessment process.

The proposed offset site has been selected on the basis site characteristics relevant to the Carnaby's Cockatoo, including:

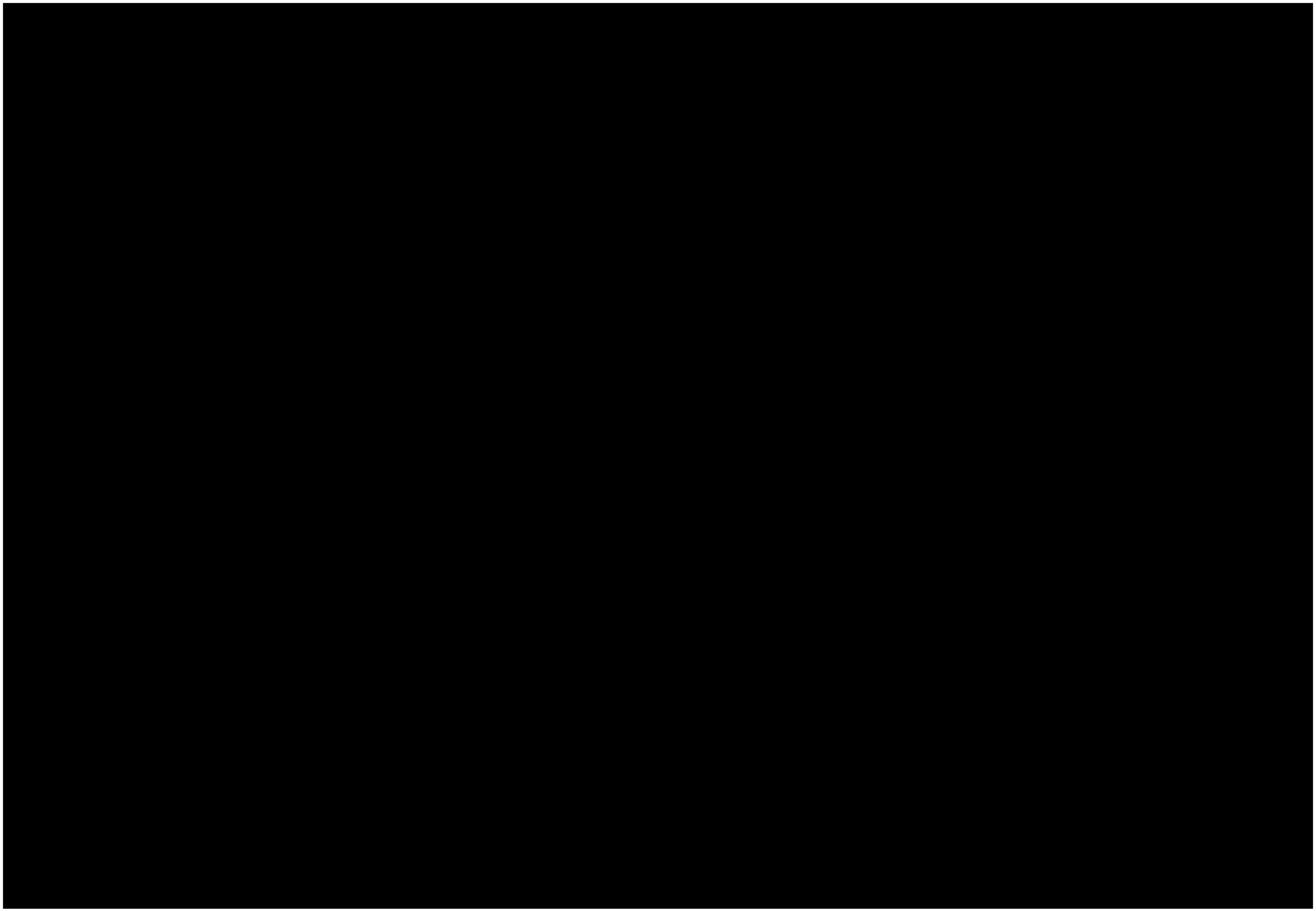
- Provides a like-for-like offset outcome, i.e.: the proposed offset provides suitable foraging habitat for the Carnaby's Cockatoo with the presence of preferred foraging species present in the form of *Banksia attenuata* (Slender Banksia) and *Banksia menziesii* (Firewood Banksia).
- The lower habitat quality score of the Proposed Offset Site allows the opportunity to improve the habitat quality at the with the aim of bringing about a net enhancement of the Site and increase its 'value' to Carnaby's Cockatoo.
- Increases the area of Carnaby's Cockatoo habitat at a regional level that is set aside for conservation in perpetuity through addition to the Western Australian conservation estate managed by local government, a state government organisation, or other suitable managing organisation.
- According to Bamford (*Pers. Comm.,* 2024), the importance of the proposed offset location for the Carnaby's Cockatoo at a regional level is likely to be under-estimated as there have been few habitat surveys/assessments carried out to adequately document usage patterns.

A summary of the inputs to the offsets calculator as they relate to a land acquisition to offset 100% of impacts to Carnaby's Cockatoo foraging habitat are provided in Table 17.

6.3.1 Proposed Offset

[redacted] will purchase [redacted]. This portion will be excised and subdivided from a larger Lot of [redacted], with the balance of the Lot remaining in the ownership of the Vendor (Figure 22). [redacted] will be the land manager of the Site, with appropriately qualified and experienced consultants and contractors engaged to carry out specific works when appropriate.

The subdivided portion of [redacted] will be zoned Rural in the first instance, as per the parent Lot, noting that it is being purchased to serve conservation purposes as an offset site for the current proposed action (EPBC 2022/09324) for Meteor Stone, with the remainder of the site being banked to meet any future offset requirements under a 'share' arrangement. It is anticipated that 27.5 ha of the Site will meet the offset site required by Meteor Stone to counterbalance the residual impacts associated with clearing of 6.495 ha of Carnaby's Cockatoo foraging habitat, noting that the final determination of the offset area and location will be confirmed during the environmental assessment process. When confirmed, a conservation covenant will be placed over the Meteor Stone offset location to ensure it is protected for conservation purposes in perpetuity in, with the indicative area and location provided in Figure 23.



Key information about the proposed offset site includes:

- It is located approximately [redacted] north of the Proposed Action Area just north of the [redacted] (Figure 22). At this distance, the site will benefit the regional Carnaby's Cockatoo population rather than the flock that utilises the PAA. This situation is increasingly common as more vegetated land within and in proximity to the Perth metropolitan area is either unavailable for purchase, available for purchase at a cost that is prohibitive to small business owners, reserved for conservation purposes, or being purchased by larger organisations. In addition, an offset that is further away provides a protection mechanism for other flocks in locations within their range rather than focussing only on those in areas where development is being progressed, thus it can be considered a form of proactive protection rather than reactive protection.
- It is immediately adjacent to several other vegetated areas that provide suitable foraging habitat for the Carnaby's Cockatoo, with potential roosting and breeding habitat within 100 – 200 m from the site boundary, as well as the likely presence of other features that are beneficial to the ecological community within the site boundary and in the broader area.
- Bamford Consulting Ecologists (2024) indicates that while there is no known breeding site within 12 km of the proposed offset site, that is more likely to be associated with a lack of survey effort rather than a lack of breeding by the Carnaby's Cockatoo.
- Additionally, Bamford Consulting Ecologists (2024) indicates that the location of the proposed offset site will contribute to the protection of an area that is likely to be recognised for increasing landscape connectivity, again highlighting the importance of the Site to regional Carnaby's Cockatoo populations, thus beyond what is required by impacted protected matter.
- The vegetation association of the site based on the Beard mapping is the same as that for the PAA, namely 949, which is characterised as Low woodland, Banksia (Section 3.1.7.2) (Figure 24).
- The dominant vegetation is reasonably intact Banksia Woodland (Figure 24), noting that the preliminary due diligence site visit by MBS Environmental personnel was carried out in December 2023, after the spring flowering season for many flora species on the Swan Coastal Plain.
- Use of the site by Carnaby's Cockatoo was confirmed through the presence of aged foraging evidence in the form of Banksia cones (Figure 24), with an indication of observation also available from Catalyst Consulting (*Pers. Comm.,* 2023).
- The assessment of the Carnaby's Cockatoo habitat within [redacted] was carried out by Bamford Consulting Ecologists (2024), with recent foraging evidence recorded and a feather found on site. *Banksia menziesii* (Firewood Banksia) and *Banksia attenuata* (Slender Banksia) were noted as the dominant species, with *Eucalyptus todtiana* (Coastal Blackbutt) also recorded. The absence of the Forest Red-tailed Black Cockatoo was also confirmed.
- Preliminary information relating to the vegetation type and potential threatening process was provided (Bamford Consulting Ecologists, 2024; Bamford, *Pers. Comm.,* 2024).
- A seasonal wetland characterised as a dampland with a basin form is present in the northern portion of the site, thus a potential water source is present within the site for at least part of the year, with several more within 2 km of the proposed offset boundary.
- The site is located within 4 km of confirmed Carnaby's breeding areas and 8 km of black cockatoo roosting sites.
- The proposed offset location represents a like-for-like offset in that the value of the Proposed Action Area that requires the offset is Carnaby's Cockatoo foraging habitat, and which is the primary value of the proposed offset site.
- The proposed offset site is not being used as an offset site for other processes. Lot 2 is zoned rural and there is no memorial on the title indicating there is a current conservation covenant over the land.

Figure 24: Offset Site Carnaby's Cockatoo Attributes

Source: MBS Environmental, 2023

- A preliminary Offset Management Plan (OMP) has been prepared that provides a guide as to how the overall offset site will be managed to bring about an enhanced environmental improvement for the Carnaby's Cockatoo. For Meteor Stone's portion of the offset site, the aim will be to restore that portion to the same quality as that within the Proposed Action Area. The OMP has been prepared in accordance with the *Environmental Management Plan Guidelines* (Department of Climate Change, Energy, the Environment, and Water, 2024), and includes:
  - An overview of the Proposed Action and the Proposed Offset Package.
  - Site conditions at the proposed offset site.
  - Outcomes of the Carnaby's Cockatoo assessment that have informed the OMP.
  - The management framework that will be applied.
  - A review of key threats to the values of the offset Site.
  - Proposed management actions, including key performance indicators and triggers for corrective action.
  - Risk review and management.
  - Monitoring.
  - Evaluation, reporting, and contingency measures.
  - The baseline conditions delineated during the 2024 Carnaby's Cockatoo habitat assessment that will inform the management plan.

— Management plan review.

As one key principles of the *Commonwealth Offsets Policy* are for them to be effective and reasonable (No 7, Table 14), for a small business owner, that includes for them to be cost effective and available at a reasonable cost, thus without the cost being the difference between staying in business and doors shutting. For Meteor Stone, a privately purchased offset site with the plan for the additional area not required by the organisation will be on-sold to other entities that will purchase a share of the site that will be equivalent to the area of their offset. Thus, each shareholder will contribute to the purchase cost, along with the required annual maintenance costs, with one aspect of the effectiveness being that maintenance costs will be incurred annually rather than as a lump sum for a nominated management period at the time of approval.

6.3.2 Offset Management Plan

An indicative management plan that has been informed by outcomes of the MBS December site visit, the habitat assessment carried out by Bamford Consulting Ecologists (2024), and various desktop review activities is provided as Appendix 7. Based on currently available information, management strategies include:

- Weed control due to the encroachment noticed after the controlled burn that occurred approximately 2 years ago.
- In-fill planting in locations where vegetation coverage is patchy across the site. Preliminary estimations suggest that up to 32,000 could be installed across the site to enhance coverage, with species, planting densities, and locations to be based on an estimation of bare areas within Lot 2.
- Wetland management.
- Fencing repair and/or installation, if required.
- Pest animal control for feral cats and foxes, and rabbits if required.
- The inclusion of completion criteria, key performance indicators, monitoring activities such as transects, quadrats, and aerial imagery review, action triggers where management activities need to be enhanced for whatever reason, annual auditing and reporting in accordance with approval conditions.

6.3.3 Future Offset Site Tenure

As indicated, in time as shareholdings within the Proposed Offset Site are confirmed, each patch will subject to a conservation covenant that will set the area aside for conservation purposes in perpetuity. It is expected that the offset site will remain in the ownership of the various shareholders that have a stake in the site until approvals requirements in terms of timeframes are completed. Once completion criteria and agreed management timeframes are achieved, it is expected that that site will be ceded to one or more suitable organisation(s) for ongoing management for conservation purposes, with options including:

- Inclusion in the State conservation estate.
- Ceding to local government for conservation.
- Involvement of one or more suitable organisations, such as local environmental action groups or organisations, Traditional Owners, or educational institutions, for example.

The feasibility of each will be explored when there is a better understanding of the required management timeframes along with the provisions of the conservation covenant, and appropriate arrangements made; DCCEEW will be informed of those arrangements when they are agreed and finalised.

7. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Section 3 of the EPBC Act outlines the principals of ecologically sustainable development (ESD), with Section 3a being:

> *Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social, and equitable considerations.*

This section outlines how the proposed clearing incorporates the principles of ESD as they relate to Section 3a of EPBC Act.

7.1 ECONOMIC CONSIDERATIONS

Several short and long-term economic considerations are relevant to the continued limestone extraction within M70/138 and the Sublease 5 area, including:

- A geological assessment carried out by Landform Research (2022a) of the limestone resource present within the Sublease 5 area indicates that the site represents a good quality product that can be readily extracted with less overburden/wastes in the form of sand or damaged limestone; the expected extraction period is a minimum of 10 years, and potentially up to 20 years depending on product demand; a copy of the document is provided in Appendix 2.
- Meteor Stone has been in operation for more than 30 years within the Sublease 1 and other nearby locations, with its workforce representing the direct economic support of 22 – 25 families.
- Limestone is sought after commodity in the building industry, with several State Government clients seeking quality limestone blocks for current projects; support for this commodity need was provided with original the referral.
- The Nowergup location means a resource that is accessible, in demand, and close to project locations, limiting transportation costs and exhaust emissions (greenhouse gases) associated with truck movements.
- For any limestone product that is not suitable for the production of limestone blocks, it can be crushed and used to create road base and/or reconstituted limestone blocks in the Meteor Stone processing plant in Lot 6 to the west of the M70/138 tenement, limiting transportation costs and exhaust emissions associated with truck movements.

7.2 ENVIRONMENTAL CONSIDERATIONS

Positive and negative environmental considerations associated with proposed clearing of Carnaby's Cockatoo foraging vegetation include:

- The clearing of 6.495 ha of proteaceous vegetation dominated by *Banksia sessilis*, a favoured foraging species of the Carnaby's Cockatoo; the site will be restored at the conclusion of the limestone resource extraction process (temporary negative consideration).
- There are no Marri, Jarrah, Tuart, or other tall tree species known to develop hollows over time suitable for breeding by black cockatoos, thus there will be no impacts to roosting and/or nesting by Carnaby's Cockatoo (positive consideration).
- The location of the site in the northern Perth metropolitan area means an accessible resource, close to the surface and close to client project locations, thus minimising the amount of greenhouse gas emissions associated with transportation costs. Greenhouse gas emissions will also be minimised as the main product will be the extraction of limestone blocks that will not require any additional process as they will be used for the construction of masonry walls and the like (positive consideration).
- The minimisation of greenhouse gas emissions will lead to a reduced organisational impact on global climate change (positive consideration).

7.3 SOCIAL CONSIDERATIONS

There are several social considerations associated with the extraction of limestone within the Proposed Action Area, including:

- Maintaining the employment of 22 – 25 individuals and their dependents for another 10 – 20 years (estimated).
- Improving the liveability of families and individuals living in proximity to train lines and major roads that will have masonry walls constructed from the limestone blocks extracted from the Site that will reduce the noise impacting their residences from vehicles and trains.

7.4 EQUITABLE CONSIDERATIONS

Equitable considerations relate to intra- and inter-generational equity, or consideration of current and future generations. In relation to the Proposed Action Area, the extraction of the limestone will represent a permanent 'loss' of an *in situ* resource. However, its use in the construction industry contributes to 'gains' through its use for masonry noise walls that will improve the amenity of residents for a minimum of two generations.

The vegetation at the Proposed Action Area will be cleared to support the quarrying of the limestone with an anticipated extraction period of 10 – 20 years. The native vegetation at the Site will be restored at the conclusion of those activities, thus the loss will be temporary overall.

8. ENVIRONMENTAL RECORD OF THE PROPONENT

8.1 ENVIRONMENTAL RECORD

Meteor Stone Pty Ltd has been in operation for 31 years and has complied with all conditions associated with mining and environmental approvals. There have no proceedings under Commonwealth, State, or local environmental or other laws against either the company or its executive officers.

8.2 ENVIRONMENTAL POLICY

A copy of Meteor Stone's environmental policy is provided as Figure 25.

8.3 ENVIRONMENTAL PLANNING FRAMEWORK

As indicated in Section 8.1, Meteor Stone has been in operation for more than 30 years, after commencing operations in 1991. Some early environmental approvals have applied for in the name of the tenement holder of M70/138, Adelaide Brighton Cement Ltd T/A Cockburn Cement, through the Department of Mines, Industry Regulation and Safety, including the preparation of the current Mine Closure Plan (MCP) (Landform Research, 2020). As Cockburn Cement allows extraction of limestone under Sublease arrangements, any approval conditions/requirements are transferred to each leaseholder, thus Meteor Stone as the holder of Subleases 1 and 5 are expected to the comply with the requirements of the current version of the MCP, including those relating to site rehabilitation at the conclusion of extraction activities.

Landform Research is the agent that acts of behalf of Cockburn Cement, and so works closely with Meteor Stone and the other Sublease holders in terms of advising them of requirements that they need to comply with. Landform Research also takes an active interest in activities undertaken by the leaseholders that could have an impact on Cockburn Cement's interests as the tenement holder.

Note that Meteor Stone has applied for a clearing permit through DEMIRS that is currently progressing through the assessment process (as at January 2024) to clear the 6.495 ha area as per the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 that is also the subject of this referral to the DCCEEW. When granted, the clearing approval will include a range of conditions relating to weed control, site rehabilitation post limestone extraction including the preparation of a site-specific rehabilitation plan, record keeping and reporting requirements.

METEORSTONE
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Environmental Policy

Meteor Stone is a leader in the supply of limestone and cladding products within Western Australia, thus is reliant on the environment for the source of limestone and other materials that make up its product range. As a result, the key aim of our environmental policy is to demonstrate out commitment to reducing the environmental impacts associated with our operations. We will do this by:

- Considering the efficiency of resource removal through the targeting of quality product, depth to the resource, likely amount of overburden and other non-target materials such as sand.
- Considering the efficiency of plant and equipment used in the extraction process and maintaining it according to manufacturer's guidelines to minimise exhaust emissions and reduce the likelihood of hydrocarbon leaks or spills.
- Complying with all applicable environmental legislation, operational approval conditions, policies, and guidelines.
- Minimising the production of waste associated with our operations, including those associated with quarrying, transportation, and office activities; where possible, we will recycle and reuse materials.
- Undertake a continuous improvement program through the regular review of environmental impacts associated with our operations and how they can be reduced.
- Considering the impacts associated with our buying/purchasing practices of goods and services, and what we can do to facilitate the purchase of sustainable products.

[redacted]

Anthony Randazzo
Managing Director

Version 1, 21 November 2022

Figure 25: Environmental Policy

9. OTHER APPROVALS AND CONDITIONS

This Section provides details of approvals expected at a state level that also relate to the clearing of 6.495 ha of Carnaby's Cockatoo foraging habitat.

9.1 OTHER APPROVALS

There are several additional approvals that relate to Meteor Stone's operations within mining tenement M70/138 and the Sublease 5 area; these are outlined in Table 18.

9.2 MONITORING, ENFORCEMENT, AND REVIEW

9.3 CLEARING PERMIT APPLICATION

It is expected that the WA clearing permit application will include a range of conditions, including those relating to the prevention of weeds, their control, implementation of dust control and dieback prevention measures. These activities are standard practice for current operational activities and will be extended to the Sublease 5 Proposed Action Area. Activities that assist with weed and dieback control include:

- Vehicles accessing the site use the existing road network for access and egress, with neighbourhood roads being sealed. The access way into the site is trafficable, being constructed from crushed limestone, and is wide enough to allow the safe passage of trucks entering and leaving the site. Vehicle movement within the site is limited to cleared tracks and operational areas only.
- Plant and equipment will remain within the operational quarry for the duration of activities.
- Dust control via the use of a water tanker or similar is carried out on an as required basis, particularly during drier months. As the removal of the limestone proceeds over time and the depth of the pit increases, the sides of the pit increasingly act as a barrier to dust movement.
- The location of the operations within an active mining tenement, and the location of the Sublease 5 area within a vegetated area means that offsite impacts associated with dust are not expected.

Post extraction site rehabilitation will occur at the conclusion of all useable limestone. This will be carried out in accordance with the current version of the Mining Closure Plan (Landform Research, 2020), and be consistent as far as possible with the vegetation community currently present within the Proposed Action Area. A draft rehabilitation plan has been prepared, noting that it will be revised and finalised when extraction is nearing completion. The draft plan includes information relating to:

- Flora species selection.
- Site preparation activities, including any weed and pest animal control.
- Planting zones and density.
- Completion criteria.
- Monitoring requirements to determine success or the need for additional infill planting, weed control, or similar.
- Reporting outcomes at the frequency specified on the clearing permit instrument.

In addition to the above, the proposed [redacted] offset site will ensure that residual impacts associated with the clearing of the PAA will be set aside in perpetuity as part of the conservation estate to assist with ensuring the ongoing availability of habitat suited to Carnaby's Cockatoo usage, at least for foraging, which is consistent with the value (like-for-like) provided to the Carnaby's Cockatoo.

9.3.1 EPBC Act Approval

It is expected that any approval issued under the EPBC Act due to impacts on species listed as matters of national environmental significance will be similar to that issued by DEMIRS as the impacts to nominated species are the same as those that will be addressed by State approvals processes: i.e. foraging by the Carnaby's Cockatoo and potentially also the Forest Red-tailed Black Cockatoo.

A construction environmental management plan has been prepared that outlines how activities will be carried out to ensure minimal disruption/impact to MNES. This document also includes the draft rehabilitation plan that will be reviewed and adjusted in the lead up to rehabilitation of the site that will commence at the conclusion of the limestone extraction.

Compliance reporting is also expected at a frequency to be determined, given that rehabilitation activities will not commence until the cessation of the limestone extraction activities which are anticipated to be a minimum of 10 and up to 20 years post-clearing.

Table 18: Other Approvals

Approval	Legislative Requirement(s)	Status	Comments
Planning	• Perth Metropolitan Region Scheme • Wanneroo local planning requirements	In place	Long term planning at both a state and local level associated with the limestone quarrying that is currently being carried out within the mining tenement boundaries, including that proposed within the Sublease 5 area.
Clearing of Native Vegetation that is also foraging habitat of conservation significant black cockatoo(s).	• *Environmental Protection Act 1986* (WA). • Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA). • BC Act.	Applied for, currently being assessed by DEMIRS.	Approval will be issued by DEMIRS. Conditions are expected to include: • Weed control requirements. • Pest animal control requirements (if required). • Preparation of a rehabilitation plan consistent with the current version of the MCP (currently Landform Research, 2020) with rehabilitation of the site expected to be consistent with the current vegetative type and density (i.e., SCP24 priority ecological community Northern Spearwood Shrublands and Woodlands). • Control of plant pathogens and disease. • Monitoring and reporting requirements associated with the clearing permit approval and the rehabilitation plan for a nominated number of years post installation of tubestock. • Identification of suitable offset program, such as the rehabilitation of a cleared site, the purchase and setting aside for conservation purposes a currently vegetated site, other suitable option agreeable to DEMIRS.

Approval	Legislative Requirement(s)	Status	Comments
Clearing of Carnaby's Cockatoo foraging habitat.	EPBC Act.	This referral	Approval will be issued by DCCEEW. Conditions are expected to include: • Weed control requirements. • Pest animal control requirements (if required). • Preparation of a rehabilitation plan consistent with the current version of the MCP (currently Landform Research, 2020) with rehabilitation of the site expected to be consistent with the current vegetative type and density (i.e., SCP24 priority ecological community Northern Spearwood Shrublands and Woodlands). • Control of plant pathogens and disease. • Monitoring and reporting requirements associated with the clearing permit approval and the rehabilitation plan for a nominated number of years post installation of tubestock. • Identification of suitable offset program, such as the rehabilitation of a cleared site, the purchase and setting aside for conservation purposes a currently vegetated site, other option agreeable to DCCEEW.

10. ECONOMIC AND SOCIAL MATTERS

This Section provides information relating to economic and social matters as they relate to the proposed project.

10.1 SOCIAL AND ECONOMIC COSTS AND/OR BENEFITS

Social and economic costs or benefits of undertaking the project include:

- The continued employment of a long-term, stable workforce of more than 20 individuals that provide financial support for their families and will continue to do so for a minimum of 10, up to 20 years, for the duration of the limestone extraction period (economic benefit), rather than becoming unemployed and needing financial support from the Commonwealth in the form of jobseeker or other social security payments (economic cost). Estimated Meteor Stone payroll for that period is a minimum of $10M (social and economic benefit).
- Ongoing economic benefits to the state and commonwealth associated with individuals and families having financial independence and contributing to the local and regional economies as a minimum, as well as paying taxes that support the business of government.
- Economic benefits associated with Meteor Stone purchasing goods and services from its various suppliers and consultants.
- Economic benefits associated with reduced cost of the extraction and transportation of a needed resource from a greater distance than would occur from other locations, such as those north of Perth and/or those that would require the removal greater volumes of overburden.
- Meeting the needs of existing customers including Main Roads and other government agencies complete their construction projects, with the limestone being required for the construction of masonry walls along major transport routes, for example, that reduce noise impacts to nearby residents and communities (social and economic benefits).

10.2 POTENTIAL EMPLOYMENT OPPORTUNITIES

The nature of the limestone extraction process means that employment opportunities associated with the proposed action include those relating to the following project phases:

- Clearing phase if contractors are hired to undertake the clearing.
- Extraction phase if additional personnel are required to assist with various quarrying activities.
- Transportation phase when limestone blocks are transported to client sites.
- Construction activities where limestone blocks, road base or reconstituted blocks are used.
- Rehabilitation phase through the materials being supplied by specialist suppliers, the potential use of appropriately qualified contractors to assist with site rehabilitation activities, and the use of consultants to guide and report on rehabilitation activities.

10.3 PUBLIC AND STAKEHOLDER CONSULTATION

As an active quarry site, stakeholder consultation has been confined to:

- The tenement holder, Adelaide Brighton Pty Ltd.
- Adelaide Brighton's representative, Lindsay Stephens from Landform Research.
- The Department of Mines, Industry Regulation and Safety.
- Department of Climate Change, Energy, the Environment and Water.

DEMIRS undertook the first round of advertising of the clearing permit application on 22 July 2022 when it entered the assessment phase; advertising included the invitation for public authorities or a person who has a direct interest in the application to make comment, with the advertising period being open until 12 August 2022. At present, Meteor Stone has not been made aware of the number or content of any comments made during the advertising process.

Once the clearing permit decision has been made, it will be advertised again where the public can appeal DEMIRS' decision regarding the outcome of the application; based on discussions with DEMIRS, the assessment decision is subject to consideration of offset requirements associated with residual impacts relating to foraging use of the Proposed Action Area by the Carnaby's Cockatoo.
The DCCEEW assessment process of MNES is also a transparent, public process with advertising of the referral, when the assessment decision is made, when the referral decision is made, or changes to the approval conditions for example. It is recognised that details of this referral will be published by the DCCEEW in due course.

10.4 INDIGENOUS STAKEHOLDER CONSULTATION

Mining Tenement M70/138 has been a designated 'quarry' since prior to the enacting of the *Native Title Act 1993* (Cwlth), thus Native Title is extinguished across the Site. Quarrying of limestone is currently occurring within three of the Sublease areas, with other areas of the tenement currently vegetated. Accordingly, no consultation has occurred nor is planned with indigenous stakeholders.

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APPENDICES

APPENDIX 1: DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX 2: LIMESTONE RESOURCE

APPENDIX 3: PROTECTED MATTERS SEARCH TOOL

APPENDIX 4: REHABILITATION STRATEGY

APPENDIX 5: PGV ENVIRONMENTAL 2021 SURVEY REPORT

APPENDIX 6: BAMFORD CONSULTING ECOLOGISTS REPORT, 2024

APPENDIX 7: OFFSET MANAGEMENT PLAN