Carbone Bros Pty Ltd – Sand Extraction

Lot 5 Wellesley Road, Wellesley

2021/9034 Preliminary Documentation Submission

Version 4

October 2024

REPORT PREPARED BY

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Lot 5 Wellesley Road, Wellesley

2021/9034 Preliminary Documentation

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Version Register

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1.0	Draft	AB	ML	Jan 2023
1.1	Draft amended in response to DCCEEW Officer K. Sabetraftar's comments	AB	ML	June 2023
1.2	Draft amended in response to DCCEEW Officer K. Sabetraftar's comments	ST	ML	July 2024
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Record of Document Edits

Version No.	Edit	Section #
1.1	References to tables, sections and appendices throughout the text updated; Additional information for stakeholder engagement, clarification on habitat condition, and avoidance and mitigation measures table included. Offset calculations and justifications updated Includes a new Fauna Management Plan Includes a new Offset Management Plan	Updates within 2.6, 2.7, 3.1, 3.2, 4.1, 5 & 6 & Appendix list.
1.2	Reference to sections and appendices through the text updated; Additional clarification on environmental values of the Offset Areas 1 and 2, and associated surveys to the Offset Areas.	Updates within 2.5, 3, 9.6, 9.9, Figures 1&2, and Appendix, B, C, F, G, I, J and K.
1.3	Reference to sections and appendices through the text updated; edited offset site to two decimal places. Additional rewording and edits to clarify meaning and maintain consistency. Clarification on environmental values of the Offset Areas 1 and 2, and associated surveys to the Offset Areas. Includes a new Offset Management Plan.	Updates within 2.4, 3.0, 4.1, 4.2, 8.0, 9.0, 9.1, 9.2, 9.3, 9.7, 9.8, 9.9, Figure 2, and Appendix, A, B, F, G, J and K.

Front cover image: *Image of the Agonis flexuosa woodland on Lot 5, 06 May 2022*

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Executive Summary

Lot 5 Wellesley Road comprises an established sand mining operation managed by the proponent Carbone Bros Pty Ltd. The proponent has had a series of extractive industry licences (EIL) for the existing mine since the 1990s, and much of the resource within this footprint has now been exhausted.

In Aug 2020 the proponent applied to expand the mining footprint by an additional 5.18ha of land, however due to the vegetation type occurring within the expansion site, the Shire of Harvey refused the license application on the basis it would impact a threatened ecological community (Banksia Woodland) and threatened species habitat (Black cockatoo). The proponent lodged an appeal of this decision with the State Administrative Tribunal. In April 2022 it was resolved with the Shire of Harvey that the expansion footprint should be amended to:

- Avoid all Banksia Woodland; and
- Allow for a 20m vegetated buffer between the extraction area and the Banksia woodland

The new proposal incorporating the avoidance principle, reduces the area of disturbance to 3.4ha of which only 2.33ha of remnant vegetation will be cleared, comprising degraded *Agonis flexuosa* woodland. The proposed action impacts vegetation that represents habitat for the critically endangered Western Ringtail Possum (WRP) and three threatened Black Cockatoo species. These impacts are unavoidable and will be offset through the proponent placing 20.29 ha of adjacent representative vegetation under a conservation covenant.

A clearing permit application amendment (CPS 8561-1) has been submitted to the Department of Water and Environmental Regulation (DWER) to reflect the reduced 2.33ha clearing footprint. Development and Extractive Industry Licence (EIL) applications have also been submitted to the Shire of Harvey. The development approval was received in July 2022 and the EIL is pending review of provided information.

This report assesses the environmental impacts associated with the proposal on matters of national environmental significance and provides the Department of Climate Change, Energy, the Environment and Water (DCCEEW) with all additional information requested and details the avoidance, mitigation and offsetting measures that will be employed to address these impacts.

1. Introduction

1.1. Overview of the Statutory Approval Process

Carbone Bros has progressed approval in accordance with legislation. The actions and engagements undertaken to date with DCCEEW are as follows:

a) The original project proposal, which consisted of extraction over 5.18ha of land and clearing of both *Agonis flexuosa* woodland as well as *Banksia sp*. of the Swan Coastal Plan threatened ecological community (TEC) was referred to the then federal Department of Agriculture, Water and the Environment (DAWE) in September 2021, reference EPBC2021/9034.
b) On 4th November 2021 the project was determined to be a controlled action by DAWE and a request for further information was issued.
c) At this same time the Extractive Industry Licence application for the proposal was assessed by the Shire of Harvey, and the Shire were not willing to accept the loss of Banksia TEC vegetation. Through negotiation it was determined that the proponent would omit from the project footprint the Banksia Woodland TEC vegetation and a 20m buffer to protect it from edge effects.
d) As a result, the proponent submitted a 'variation to proposal' to DCCEEW on 28th July 2022 to reduce the disturbance footprint to 3.4ha, within which 2.6ha is remnant native *Agonis flexuosa* woodland with 28 potential black cockatoo habitat trees impacted.
e) The variation was approved by DCCEEW on the 25th August 2022.
f) It was confirmed with DCCEEW on 24th October 2022, that given the proposal changes the preliminary documentation does not need to refer to impacts on Black cockatoo foraging or *Banksia sp.* TEC impacts any more. The proponent also clarified that, with better aerial imaging the area of actual impact was refined to **2.33ha** of *Agonis flexuosa* woodland and only **27** habitat trees, less than stated in the variation. DCCEEW confirmed that a further variation request for this change is not required.

1.2. The Proponent

The proponent for the proposed action is Carbone Bros Pty. Ltd. Contact details are listed in Table 1 below.

Table 1. Proponent and proposal key contact

Proponent	Carbone Bros Pty. Ltd PO Box 61, Brunswick Junction, WA 6224 4 Papps Road, Brunswick, WA 6224 Telephone: 08 9726 1178 Email: admin@carbonebros.com.au Web: www.carbonebros.com.au/
Proposal Key Contact	Lundstrom Environmental Consultants 896 Canning Hwy Applecross WA 6153 Phone 0417934863 Email: admin@lundstrom-environmental.com.au

1.3. Purpose of this report

An original referral under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) was made in September 2021 for the clearing of an additional 5.18ha of native vegetation. On 4th Nov 2021 the proposed action was determined to be a controlled action and that it will be assessed by preliminary documentation and details of additional information required for the preliminary documentation were issued in a letter on the 2nd Dec 2021 (EPBC 2021/9034).

Since then, the proponents chose to implement avoidance measures and reduced the requirements to clear to only 2.33ha of native vegetation, avoiding all Banksia Woodland TEC. In correspondence with the DCCEEW on the 4th October 2022 (via email), it was advised that the additional information requested still must be provided through the preliminary documentation, however the references to Banksia TEC and Black Cockatoo foraging habitats can be removed as they are no longer included in the extraction footprint.

This preliminary document aims to set out the specified information required by the Minister under section 95A of the EPBC Act for the assessment of the impacts of the proposed action (the 'preliminary documentation') as well as to provide details of any changes made to the proposed project subsequent to the action being referred under the EPBC Act.

Table 2 presents a summary of the information requested as part of the preliminary documentation and the corresponding section in this report.

Table 2. Information requested for preliminary documentation

Information Requested	Details of Information Requested	Report Section
"Rehabilitation objective for this project is to establish a stable landform and a self-sustaining pastures grass cover with a minimal amount of weed species"	• Please explicitly define 'stable landform and a self-sustaining pastures grass cover'. • Are you proposing to translocate plants or are you proposing to use the cleared vegetation to mulch the rehabilitation area? • Please outline these details in your rehabilitation plan; confirm which plan would include these details (e.g. Pit rehabilitation and Maintenance Management Plan); and provide it to the department for review. • Provided document must summarise the proposed rehabilitation activities for all disturbed areas associated with the proposed action. At a minimum, the document must include details on: o rehabilitation acceptance criteria, including a discussion of how the rehabilitation will restore habitat for relevant listed threatened species; o procedures, including contingency measures that will be undertaken to achieve the rehabilitation acceptance criteria; and o a monitoring program to determine the success of the rehabilitation activities implemented by the proponent. If relevant, the preliminary documentation must provide details of any further rehabilitation activities proposed to be undertaken as required by Commonwealth, State, and local government legislation. Attach relevant Commonwealth, State and local government approvals and permits as supporting documents to the preliminary documentation.	Section 7, Table 11, Appendices A & B
Rehabilitation will establish a stable landform with areas being progressively rehabilitated with native vegetation in accordance with the DWER clearing permit conditions.	• Please confirm whether progressive rehabilitation will be undertaken or whether rehabilitation will be undertaken after the completion of mining. • Please provide details about rehabilitation including: o Site Location;	Appendix A & B Note: no native vegetation rehabilitation is proposed

Information Requested	Details of Information Requested	Report Section
	○ Pre-inspection survey; ○ Rehabilitation objectives; ○ Rehabilitation works schedule; ○ Seed and plant supply; ○ Vegetation type for rehabilitation; ○ Rehabilitation completion criteria; ○ Topsoil management; ○ Weed management; ○ Dieback management; ○ Rehabilitation management; ○ Rehabilitation performance monitoring. • Confirm which plan will include these details; and provide it to the department for review. Please provide the clearing permit conditions from DWER for the department to review with regards to rehabilitation.	
Black Cockatoos Carnaby's black-cockatoo (*Calyptorhynchus latirostris*) – Endangered; Baudin's black-cockatoo (*Calyptorhynchus baudinii*) – Endangered; Forest red-tailed black-cockatoo (*Calyptorhynchus*	• Provide details (in a table) about the native vegetation that surrounds the project area (within land Lot/s you own): • Vegetation types (e.g. vegetation species composition) and extent; • Suitability of foraging habitat; and number of roosting and breeding trees or known breeding or roosting locations within 12 km of the project area. • Provide detail the similarities and differences of the roosting, foraging and breeding habitat in contrast to that within the project area • Provide an assessment of potential impacts (direct and indirect) on Black Cockatoos as a result of	Section 3.1, Table 7 & Section 3.2 Sections 4.1 & 5.1 Appendix E, F, H & J

Information Requested	Details of Information Requested	Report Section
banksii naso) - Vulnerable	project activities. This should include consideration of potential indirect impacts to adjacent areas of Black Cockatoo habitat. Contextual information about the habitat in the area would also be useful, and should include consideration of any nearby breeding and roosting records. • Provide proposed avoidance and mitigation strategies for management of direct and indirect impacts on Black Cockatoos. You may wish to provide this information in an Environmental Management Plan (EMP), however if this is the case, the EMP must be provided to the Department for review. • Provide an assessment of the acceptability of impacts (direct, indirect and cumulative) on Black Cockatoos, considering the proposed avoidance and mitigation measures, against the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* and statutory documents for these species, namely: The assessment must demonstrate that the proposed action is not inconsistent with the recovery plans noted above and that it has had regard to the relevant conservation advices or other guidelines for these species. If there are significant residual impacts, after avoidance and mitigation measures, then provide an offsets package or offsets proposal as detailed later	
Western Ringtail Possum (*Pseudocheirus occidentalis*) – Critically endangered	• Provide the results of a targeted Western Ringtail Possum survey of the proposed action area, undertaken in accordance with requirements set in Department of Sustainability, Environment, Water, Population and Communities (2011), *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act*. • Provide an assessment of potential impacts (direct and indirect) on Western Ringtail Possum as a result of project activities. This assessment should include the impacts of the proposed action on fauna corridors necessary for the movement of the species. • Provide avoidance and mitigation strategies for management of direct and indirect impacts on Western Ringtail Possum. You may wish to provide this information in an Environmental Management	Sections 3.3, 4.2 & 5.2 Appendix E and H

Information Requested	Details of Information Requested	Report Section
	Plan (EMP), however if this is the case, the EMP must be provided to the Department for review. • Provide an assessment of the acceptability of impacts on Western Ringtail Possum guided by survey results and considering the proposed avoidance and mitigation measures, against the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* and the statutory documents for this species, namely: ○ Threatened Species Scientific Committee (2018). *Conservation Advice* Pseudocheirus occidentalis *Western ringtail possum*. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/25911-conservation-advice-11052018.pdf ○ Department of Parks and Wildlife (2017). *Western Ringtail Possum* (Pseudocheirus occidentalis) *Recovery Plan.* Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA. Available from: http://www.environment.gov.au/biodiversity/threatened/ publications/recovery/western-ringtail-possum-recovery-plan ○ Department of the Environment (2015). *Threat abatement plan for predation by feral cats.* Canberra, ACT: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/ threatened/publications/tap/threat-abatement-plan-feral-cats ○ Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008*). Threat abatement plan for predation by the European red fox.* DEWHA, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox The assessment must demonstrate that the proposed action is not inconsistent with the threat abatement plans and recovery plan and that it has had regard to the conservation advice or other guideline for the species If there are significant residual impacts, after avoidance and mitigation measures, then provide an offsets	

Information Requested	Details of Information Requested	Report Section
	package or offsets proposal as detailed later.	
Carbunup King Spider Orchid (Caladenia procera) – Critically Endangered *Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid (Drakaea elastica) – Endangered* *Tall Donkey Orchid (Diuris drummondii) – Vulnerable* *Dwarf Bee-orchid (Diuris micrantha) – Vulnerable* *Dwarf Hammer-orchid (Drakaea micrantha) – Vulnerable*	The Department notes that a flora survey was undertaken at the proposed action area and that none of the EPBC Act listed threatened orchids species that are considered likely to occur in the area have been identified. However, as noted in the Draft survey guidelines for Australia's threatened orchids, multiple surveys are often necessary for confident detection of cryptic orchid species. For this reason, the Department requires: • An additional flora survey of the proposed action area to confirm the presence/absence of EPBC Act listed orchid species within the project area. The survey must be meet the requirement in the guideline noted above. • If any EPBC Act listed threatened orchid (or other flora) species is identified, provide a full assessment of impacts, and consideration of the need for an offset, guided by the requirements set above. The relevant statutory documents for these species are provided later.	Sections 3.4, 4.3 & 5.3 Appendix F & I
Avoidance and mitigation measure	Provide copies of your proposed avoidance and mitigation measures for the departments review as follows: • Pit Rehabilitation and Maintenance Plan; • Water Management Plan; and • Weed Management Plan.	Section 6 &Table 10 for all Avoidance & Mitigation Measures See Appendix A EIL EMP for Weed, Dust & Dieback Water MP required

Information Requested	Details of Information Requested	Report Section
		Mgt Plans See Appendix B for Rehab Plan
Public consultation with Indigenous stakeholders and indigenous heritage values.	Provide evidence of consultation between you and the Gnaala Karla Booja People regarding Indigenous cultural heritage matters and native title claims within the project area of the proposed action.	Section 2.6 Appendix D
Economic Impact	Indicate how the proposed action could economically impact the local community. These impacts may be positive or negative	Section 2.7
Offsets	The proposed offset package must include the following: Details of the proposed direct offset package, including, but not limited to: • a description of the proposed offset site(s) including location, size, condition and relevant ecological/species habitat features, landscape context and cadastre boundaries of the offset site(s) (supported by coordinated mapping). • evidence of the presence of, or usage by, relevant protected matter(s) on, or adjacent to the offset site(s), and the presence and quality of habitat for protected matter(s) on the offset site. • these details should be based on recent site surveys or analysis of available contemporary site data, reference to research, studies or other publications relevant to the protected matter(s) and include reference to the site survey and habitat assessment methodology used. • current and likely future tenure of the proposed offset site and details of how the offset site will be legally secured for the full duration of the impact. Demonstrate how the proposed direct offset package will maintain or improve the viability of the protected matters with: • offset completion criteria (i.e. environmental outcomes) to be achieved, and reasoning for these in reference to relevant statutory recovery plans, conservation advices, and threat abatement plans (e.g. within 15 years of commencement of the action, 85% of the offset site contains x density of habitat trees). This information could be provided in a table format.	Section 9 & Appendices G & K

Information Requested	Details of Information Requested	Report Section
	• milestones to demonstrate adequate progress towards achieving the offset completion criteria. • specific environmental management activities and mitigation measures that will attain and maintain the completion criteria, including the management of threats to relevant species and the timing of actions. • baseline survey information to determine the presence of relevant protected matters and the extent and quality of the respective habitat(s) at the offset site(s) • a monitoring and corrective action program to measure the success of the environmental outcomes, which must include performance indicators, milestone outcomes, monitoring requirements, trigger values, corrective measures, and identified roles and responsibilities • evidence of how the proposed offset completion criteria for the proposed offset will be achieved and maintained over the duration of the impact. • justification of how the proposed offset package meets the requirements of the *EPBC Act Offsets Assessment Guide*. This information should include an appropriate reference to the Offset Guide (i.e. offset calculator and justification of figures used in the calculation), as well as the following: o evidence of the likely effectiveness of any proposed management actions (i.e. rehabilitation/restoration/re-creation of habitat) to support quality improvement and/or maintenance of the proposed offset site(s) for the relevant protected matter(s); o the time over which management actions will deliver the proposed improvement or maintenance of habitat quality for the relevant protected matter(s); o the risk of damage, degradation or destruction to any proposed offset site(s), in the absence of any formal protection and/or management, over a foreseeable time period (20 years). This information is important in determining the comparative benefit of a proposed offset; and • evidence to support 'confidence in results' for averted loss and quality scores. • justification of how the proposed offset package meets the requirements of the *EPBC Act Offsets Assessment Guide* and Offsets Policy	

Information Requested	Details of Information Requested	Report Section
Details	Proposed avoidance and mitigation measures must be discussed in terms of their expected effectiveness, with evidence provided as appropriate to demonstrate this. Management commitments by the person proposing to take the action must be clearly distinguished from recommendations or statements of best practice made by the document author or other technical expert. It is preferable to provide a consolidated table of management commitments, including details on funding, roles and responsibilities and measurable performance criteria. Commitments should be made using unambiguous language, i.e. use 'will' and 'must' when committing to actions instead of 'where possible', 'where practicable', 'as required', 'to the greatest extent possible', and 'should' or 'may'.	Section 6 & Table 10
Economic and social matters	The preliminary documentation must provide information about the expected economic and social impacts of the proposed action (both positive and negative). This should include, but not necessarily be limited to, • the consideration of costs (e.g. disruption to existing community infrastructure or environmental features) and benefits (e.g. increased housing or employment) of the proposed action, including the basis of any estimations of costs and/or benefits; • details of any public and/or Indigenous stakeholder consultation activities, including the outcomes of those consultations; and • consideration of different scales of economic and/or social impacts where relevant (e.g. local versus national).	Sections 2.6 & 2.7

2. Description of Proposed Action

2.1. Location, Tenure & Landuse

Table 3. Property description

Property Description	Lot 5 on Plan 5888 335 Wellesley Road, Wellesley, Shire of Harvey
Volume	1826
Folio	663
Area	103.1 ha
Ownership	Lyndon Mervyn Edwards

The property is zoned under the Greater Bunbury Regional Scheme, as industrial and falls under the Kemerton Strategic Industry Zone which "provides for manufacturing industry, the storage and distribution of goods and associated uses".

Figure 1 shows the regional location of the property.

Currently the property is used for sand extraction, with some actively grazed pastures and the remainder remnant vegetation, including a conservation covenant.

2.2. Proposed Action

Construction and operations will entail the following actions:

- The new proposed extraction area (Stage 10) will comprise 3.4ha of extraction footprint.
- The area will be stripped of topsoil which will be placed in stockpiles within the extraction license footprint.
- Within the cell a bulldozer will rip and blade material to a stockpile. Trucks will enter the pit from Wellesley to be loaded from the stockpile by a front-end loader.
- Excavation will proceed until a level of 30m AHD has been reached.
- Where possible, topsoil will be replaced and seeded on a progressive basis, in areas already worked, just prior to the wet season.
- The final land surface will have batters with a gradient no greater than 1:3.
- The existing approved extraction area (Stages 7-9) will be rehabilitated to pasture grasses after mining has been completed.
- The proposed new extraction (Stage 10) will also require rehabilitation with pasture grasses once complete.
- The proposed offset package will be covenanted with the National Heritage Trust.

2.3. Schedule of operations

The proposal is scheduled to commence in 2023 and be completed by 2038. These dates are subject to change depending on several factors and the relevant regulatory authorities will be kept informed of the proposals progress through the submission of annual reports.

2.4. Decommissioning and rehabilitation

Carbone Bros have previously committed to rehabilitating the completed extraction pits (Stage 1-3 and Stages 4-9) under existing approvals (11/00140, A2409/EX/001 and A2409/EX/002) to a combination of pasture grasses and native vegetation.

For the proposed action (Stage 10) the proponent plans to rehabilitate the extraction footprint to pasture grasses. The rehabilitation plan provides details on the staged actions and timing to meet rehabilitation commitments. The rehabilitation plan is included in Appendix B.

To offset the impact on WRP habitat and black cockatoo breeding habitat with the removal of 2.33ha of *Agonis flexuosa* woodland and 27 potential cockatoo habitat trees, the proponent must reserve 20.29 ha of Good to Excellent representative vegetation across two blocks directly north and to the southeast of the proposed action site. These areas will be reserved as conservation covenant and fenced as per the detail outlined in Section 9.

2.5. Planning Framework and Government Requirements

A Development Application (DA) and Extractive Industry Licence (EIL) application for the proposed 3.4ha footprint was submitted. The DA was approved and the EIL is pending approval upon review of requested documentation by the Shire of Harvey. Flora and fauna surveys have been undertaken and a clearing permit (CPS 8561/1) has been applied for (and subsequently amended with the reduced clearing requirements) with DWER.

Table 4. Regulatory Instruments

Instrument	Issued	Description	Expiry	Status
Shire Planning Consent (Ref: 12/31662) (A2409/EX/001)	25th March 2013	Stages 4 to 8	25th March 2018	Expired
Shire Extractive Industry License (A2409/EX/001)	23rd May 2013	Stages 4 to 8	25th March 2018	Expired
DWER Extraction Licence Cat 12 – screening of material (L9234/2019/1)	14th July 2020	Stages 4 to 9	13th July 2040	Current
Shire Development Approval (Ref: P43/18/18/10669) (A2409/EX/002)	3rd Sept 2018	Stage 9 only	3rd September 2023	Expired
Shire Extractive Industry Licence (A2409/EX/002)	23rd Nov 2018	Stage 9 only	3rd September 2023	Expired
Shire Development Approval Extension (Ref: P111/21/21/09145) (A16076/EX/002)	31 May 2021	Stages 4,5,7 and 8	29th Nov 2023	Expired
Shire Extractive Industry Licence	29th Nov 2021	Stages 4,5,7 and 8	29th Nov 2023	Expired

(A16076/EX/002)				
Shire Development Approval Extension (P302/23) (A16076/ EX 004)	11th Sep 2023	Stages 4, 5, 7-9	11th Sep 2028	Current
Shire Extractive Industry Licence (P302/23) (A16076/ EX 004)	11th Sep 2023	Stages 4, 5, 7-9 Process and Remove Existing Stockpiles, Batter Shaping and Rehabilitation	11th Sep 2028	Current
DWER Clearing Permit (CPS 8561/1)	Submitted, being assessed	Stage 10- still in planning phase	-	Pending
Shire Development Approval (Ref: 22/07973) (A016076/EX/003)	5th July 2022	Stage 10 – still in planning phase	5th July 2027	Current
Shire Extractive Industry Licence (A16076/EX/003)	Not yet issued	Stage 10 – still in planning	-	Pending

Approval conditions are required to be monitored annually by the proponent with compliance reports provided to the approving authority each year. The Approval for Stage 10 (Planning Consent) and its conditions are attached in Appendix C. However, it should be noted that these conditions may be modified once the final approval (under EPBC Act) for the site has been issued.

2.6. Stakeholder Consultation

As a requirement of the approval processes, the proposal has been publicly advertised. Engagement with stakeholders including the Shire of Harvey, the landowner and local residents is ongoing.

Desktop study was conducted to assess the proposals impact on Aboriginal heritage and to address matters of Native Title. As per the Aboriginal Heritage Inquiry System, there is a “Other Heritage Place”, ID 5807, which intersect a small portion of the proposed extraction footprint to the east, as shown in Insert 1 below. The report for this heritage place indicates status of the site as “Stored Data/Not a site”, which means the place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*.

Insert 1: 100ha buffer around 'other heritage place' 5807

As per the "Aboriginal Heritage Due Diligence Guidelines, April 2013", Aboriginal Heritage means the Aboriginal site or object as defined in Section 5 and 6 of the Western Australia's *Aboriginal Heritage Act 1972*, therefore it is unlikely that any Aboriginal Site as defined by the *Aboriginal Heritage Act 1972,* will be impacted by the proposed action.

The site falls under South West Settlement Area and Gnaala Karla Booja Indigenous Land Use Agreement. On the 17th of October 2018, the Native Title Registrar registered six Indigenous Land Use Agreements (ILUA), essentially recognising that the Noongar people and the State of Western Australia have reached a full and final settlement of all current and future applications made or to be made by Noongar people under the *Native Title Act 1992*. On the 15th of June 2021, the South West Aboriginal Land and Sea council; (SWALSC) and the State of Western Australia executed the six Indigenous Land Use Agreements (ILUAs), where the parties agreed to and consented to Surrender Native Title Rights and Interests. The Gnaala Karla Booja (GKB) WC 1998/058 NTC group are now known as the Gnaala Karla Booja ILUA group. The GKB have surrendered their Native Title and the relevant freehold land has extinguished any Native Title on Lot 5 Wellesley Road.

Due to the nature of the development and the fact there is no native title claim over the area nor aboriginal cultural matter associated with the property, there is no need for engagement with the GKB people for this project. As shown on Insert 1 above. The accompanying email asking the opinion of DLPH and their response on the matter is included in Appendix D. In summary the email states

" The proposed pit expansion intersects with ID 5807 (Harvey55/Brunswick Junction), however ID 5807 has been assessed by the Aboriginal Cultural Materials Committee to NOT meet section 5 of the Aboriginal Heritage Act 1972. This means that under State Aboriginal heritage legislation there is no requirements for you to seek approvals for the pit expansion."

In order to ensure that this was indeed the case, the matter was referred the DLPH requesting any comments they may have on the issue that had been identified by searching on the heritage site data base identified on their mapping system.

The Engage Early Draft Policy Statement provides guidance on when Indigenous communities should be consulted (in addition to the statutory public comment periods required under Part 8 of the EPBC Act, i.e., Assessing impacts of controlled actions. The Australian Government considers the best practice consultation includes Identifying and acknowledging all relevant affected Indigenous peoples and communities. From the desktop search of AHIS, it was conferred that indigenous communities will not be impacted by the proposed actions.

Furthermore, the proposed action will not have significant impact on the listed Indigenous heritage values of a National Heritage Place or World Heritage Property or on a protected matter that has Indigenous heritage values. The proposed action will not occur on or impact Marine Area, is not a nuclear action, or have a significant impact on the Indigenous heritage values of the place. The proposed action will not occur on an area that is or in future be subject to a native title claim or determination.

Carbone Bros Pty. Ltd. personnel and contractors are advised of their obligations under section 15 of the *Aboriginal Heritage Act 1972*, to report the discovery of any Aboriginal cultural material which may be uncovered in the course of their work or any other activities (included in the EIL EMP Appendix A, section 5.9).

2.7. Economic Impacts of Proposal

Construction and operational costs of the proposed project are provided in Table 5 and 6 below. The cost of the offsets is not included as a cost as the current market value of the land is unknown.

Table 5. Estimated Construction Costs

Infrastructure	Estimated cost
Approvals, covenanting and Survey Work	$120,000
Road construction, gatehouse, signage, and fencing	$75,000
Clearing and stripping	$25,000
TOTAL	**$220,000**

(Excludes labour costs)

Table 6. Estimated Operational Costs

Operations	Estimated cost
Excavation and trucking	$60,000 p/a
Rehabilitation	$100,000
Weed Control	$3,750 p/a
Reporting, maintenance, and mitigation	~$5,000 p/a

Employment

During the construction phase, Carbone Bros will directly employ 4 personnel to work on the proposed project, as machine operators. During operations it is anticipated that Carbone Bros will employ two and a half personnel: 2 pit operators and 0.5 administrators/managers.

The Product

It is proposed to extract sand over a 3.4 ha area. The sand resource is limited by the allowable depth of the excavation to maintain the required separation distance to the groundwater table. As a result, extraction will take place to an average depth of 30m AHD, resulting in an estimated resource of 300 000m^3. Extraction is expected to take place over 5 years; however, this will depend on demand.

Product Demand

Basic Raw Materials (BRM) are high volume, low value materials that are consumed by the communities that produce them. As such, a continual, local supply of BRM is essential to sustain community development (Department of Planning, 2012). The site is located within the Bunbury Region. The Basic Raw Materials Demand and Supply Study for the Bunbury–Busselton Region (Department of Planning, 2012) identified this area as one of the fastest growing residential development areas in Australia, requiring significant quantities of BRM.

The high-grade sand will be transported by truck to concrete batching plants in the local area that supply local markets. Demand for high grade sand for construction and infrastructure development will continue to increase in the future to support population growth (DPaW, 2014).

3. Ecological Assessment of Proposed Site

The following investigative work has been conducted for the proposal to determine the likely impacts on matters of national significance. The areas covered by each survey was not consistent due to the nature of the project changing over the last few years. To demonstrate that both the project footprint and offset areas have been sufficiently surveyed, a map showing each individual survey scope, and the location of important matters such as habitat trees and vegetation is shown in Figure 2.

Fauna Assessment – April 2018 (Appendix E): A Level 1 fauna survey (as defined in EPA 2016) was carried out over 6ha of remnant vegetation including the majority of the proposed extraction site and a portion of the vegetation to the north of the site, which makes up the south-eastern section of current Offset Area 1. Survey work included a targeted assessment for black cockatoo and western ringtail possum, a literature review and a daytime field survey on 7th April and nocturnal survey on the 9th April 2018. Field survey work was carried out by Greg Harewood (B.Sc. - Zoology).

Flora and Vegetation Survey – September 2019 (Appendix F): A detailed flora and vegetation survey was undertaken to assess the botanical values over a 6.9ha area comprised of the majority of the proposed extraction site and vegetation north of it, which makes up the south-eastern section of current Offset Area 1. Survey involved detailed survey of five 100m^3 sampling plots over a single day in spring (24th September 2019) and included assessment for black cockatoo foraging habitat and orchid survey. Field survey work and data analysis was completed by PlantEcology.

Offset Proposal Survey – October/November 2020 (Appendix G): A survey for the habitat values associated with the conservation significant species impacted by the proposal (WRP and black cockatoos) within the then proposed offset areas. Survey was completed by Lundstrom Environmental Consultants. This survey reports on the environmental values of the current Offset Area 2 and the northern section of Offset Area 1.

Fauna Assessment – Habitat Review – May 2022 (Appendix H): An additional area of remnant vegetation to the south of original survey area was assessed for black cockatoo habitat trees, foraging habitat and western ringtail possum habitat. Survey was carried out by Greg Harewood (B.Sc. – Zoology). This survey reports on the habitat value of the southern section of the clearing footprint, that was not surveyed in the 2018 survey.

Targeted Orchid Surveys – September 2022 (Appendix I): Targeted orchid spring surveys were undertaken on the 16th September and 27th October 2022 to search for five threatened orchid species that may potentially occur in the area. The surveys were undertaken by experienced botanists D. Brace and R. Smith from Ecoedge consulting.

Fauna Management Plan – April 2023 (Appendix J): A fauna management plan will be implemented which will include a relocation program to be implemented prior to and during clearing works. This will ensure direct impact on fauna is minimised. It should be noted that this Fauna Management plan refers to a larger footprint than is currently planned, but all actions proposed will nevertheless be implemented as described in it. This plan includes having a qualified fauna handler on-site during

clearing works to facilitate the safe handling, assessment and relocation of any fauna impacted during the clearing works.

3.1. Vegetation Types Surrounding the Project Area

The extraction area is surrounded by 75ha of remnant vegetation within the property with 13.4ha of this already protected for perpetuity under conservation covenant. Two vegetation complexes are mapped as occurring within the site. The Bassendean Complex – central and south occupies the majority of the site. This complex has 25% of its original pre-european extent remaining. The Karrakatta complex – central and south occupies 0.5ha at the western end of the site. This complex has 23.6% of its pre-european extent remaining.

Surveys of 6.9ha of the remnant vegetation within and to the north of the proposed extraction area, were conducted in spring of 2019, 2021 and 2022. From these surveys a total of 61 native and 14 non-native (exotic) taxa were recorded within the site, representing 33 families and 58 genera. The dominant families containing mostly native taxa were Fabaceae (6 native taxa, 3 exotic taxa), Asteraceae (6 native taxa, 4 exotic taxa), and Orchidaceae (5 native taxa). ((Plantecology, 2020)(LEC, 2020), (Ecoedge, 2022)).

From the surveys two plant communities were identified. These are described in Table 7 below.

Table 7. Identified plant communities within Lot 5 Wellesley Road, Wellesley

Plant Community	Description
Eucalyptus marginata - *Banksia attenuata* woodland	Open Woodland of *Eucalyptus marginata* and *Banksia attenuata* with *Agonis flexuosa* over *Banksia grandis* and a shrubland of *Xanthorrhoea gracilis* and *Hibbertia hypericoides* over a herbland of *Dasypogon bromeliifolius*, *Anarthria prolifera* and *Desmocladus fasciculatus* on grey sands. As the *B. attenuata* is a co-dominant (a key characteristic of the Commonwealth-listed TEC 'Banksia- dominated woodlands of the Swan Coastal Plain IBRA Region') and is in good to excellent condition and more than 2ha in size, this vegetation, specifically to the north of the proposed extraction area, meets the criteria to be considered a part of the TEC. (Plantecology, 2020)
Agonis flexuosa woodland	Woodland of *Agonis flexuosa* with *Eucalyptus marginata* over open shrubland of *Xanthorrhoea gracilis*, *Macrozamia riedlei* and *Hibbertia hypericoides* over a herbland of *Dasypogon bromeliifolius* in grey sands. This vegetation occurs across most of the site and is in a highly degraded condition with much of the mid-storey missing and the impacts of grazing activity resulting in native herbaceous understorey species having been replaced by exotic species (Plantecology, 2020)

As a result of the vegetation surveys and on request of the Shire of Harvey, the proposed extraction area was positioned in order to avoid the *Eucalyptus marginata – Banksia attenuate* woodland, with the area reduced to only 3.4ha of area, of which 2.33ha is *Agonis flexuosa* woodland. (See Figure 2)

The south-west regional ecological linkage axis line (ID#47) traverses Lot 5 from north to south, approximately 220m to the west of the proposed extraction footprint (Molloy, et al, 2009). The fauna assessment noted that the subject site is surrounded on three sides by areas of continuous native remnant vegetation and therefore the proposed disturbance area itself does not specifically represent a "linkage: or "corridor" for wildlife movement. The relatively small amount of clearing required is not likely to create any significant barriers to fauna movement on a local or regional scale (Harewood, 2018).

3.2. Black Cockatoo Survey Results

Black cockatoo breeding habitat

Black cockatoo breeding habitat is considered to consist of tree species known to support breeding within the range of the species, which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow (being greater than 500mm DBH for most Eucalypts, or 300mm in the case of wandoo and salmon gum) (DSEWPaC, 2012).

Within the proposed clearing footprint, a total of 27 potential black cockatoo breeding habitat trees (DBH ≥ 50cm) were identified. The tree species are jarrah (20), marri (4), tuart (1) and dead/ unidentifiable (2). None of the trees appeared to contain hollows large enough to allow the entry of a black cockatoo (Harewood, 2018).

Table 8 presents a summary of the survey results for trees with hollows and Figure 2 shows the location of these trees.

Table 8. Summary of trees (DBH ≥ 50cm) within the proposed clearing footprint

Area	Total No. of Habitat Trees (DBH≥50cm)	No. without hollows	No. with hollows too small for nesting Black cockatoos	No. with hollows possibly suitable for nesting Black cockatoos	Tree Species			
					Marri	Jarrah	Tuart	Dead Unknown
Stage 10	27	17	10	0	4	20	1	2

Foraging habitat

The proposed extraction site is not regarded as containing high quality foraging habitat for the three species given there is only the occasional jarrah or marri tree with the majority comprising *Agonis flexuosa* woodland over a sparse understorey and a lack of banksia species (Harewood, 2017).

No evidence of foraging debris left by black cockatoo was observed within the proposed extraction site (Harewood, 2018).

Roosting habitat

No existing roosting trees (trees used at night by black cockatoos to rest) were positively identified during the survey (Harewood, 2018).

Similar habitat in vegetation bordering the subject site can be reasonably expected to contain better roosting options for black cockatoos (Harewood, 2018).

Ecological linkage

Because of its generally poor to degraded state the area cannot be regarded as being of any specific local or regional conservation value when compared to other areas in the vicinity, much of which appears to be of a similar composition but generally in better condition (e.g. areas within the Kemerton Industrial Buffer to the south and east) (Harewood, 2018). It is not likely the proposal will impact the function of ecological linkage surrounding the site.

3.3. Western Ringtail Possum Survey Results

The proposed extraction site was surveyed in 2018 for western ringtail possum habitat. The area was found to show evidence of significant historical/ongoing disturbance (fire, partial clearing and firewood collecting) with most trees being relatively small, indicative of relatively recent regrowth and a sparse understorey. (Harewood, 2018).

No evidence of WRP activity such as dreys, scats or individuals were recorded within the proposed extraction area suggesting they are either absent from the area surveyed or present in very low densities (Harewood, 2018).

3.4. Targeted Orchid Survey Results

Several species of conservation significant orchids have been found either less than 2kms from the survey area or have been identified by DCCEEW as having the potential to occur within the survey area. These are listed in Table 9 below, along with an assessment of the presence of suitable habitat based on the literature review and field observations.

Targeted orchid surveys were undertaken in Spring of 2018 and 2022 for the listed orchid species. Field surveys were conducted by a suitably qualified and locally experienced botanists S. Chalwell (Plantecology Consulting) and R. Smith and D. Brace (Ecoedge Consultants). The targeted search was carried out after determining the optimal timing to survey the target species. Scheduling of the surveys coincided with optimal climatic conditions (good winter rainfall) following consultation with published information sources. A known population of *Drakaea micrantha* that occurs approx. 1.5km from Lot 5 Wellelsey Road was visited on the day of survey to ensure the plants were in flower and confirm timing of survey in 2022.

Table 9. Conservation significant orchids potentially occurring within the proposal area

Species	Preferred Habitat	Presence of habitat within survey area
Carbunup King Spider Orchid (*Caladenia procera*) – Critically Endangered	The species grows in Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Peppermint (*Agonis flexuosa*) woodland on alluvial sandy-clay loam flats, with Mangles Kangaroo Paw (*Anigozanthos manglesii*) amongst dense heath and sedges or low dense shrubs. (DEWHA, 2008)	No suitable habitat within the survey area (Ecoedge, 2022)
Glossy-leafed Hammer	The species grows on bare	No suitable habitat within the

Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid (*Drakaea elastica*) – Endangered	patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in banksia (*Banksia menziesii, B. attenuata* and *B. ilicifolia*) woodland or spearwood (*Kunzea glabrescens*) thicket vegetation. It requires a shady canopy to be present. (DEC, 2009)	survey area (Ecoedge, 2022)
Tall Donkey Orchid (*Diuris drummondii*) – Vulnerable	Occurs in low-lying depressions in peaty and sandy clay swamps. It is not unusual to see the plants standing in several centimetres of water, even during the summer flowering period. (DEWHA, 2008)	No suitable habitat within the survey area, too dry and no wetland areas (Ecoedge, 2022)
Dwarf Bee-orchid (*Diuris micrantha*) – Vulnerable	Occurs on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water. (DEWHA, 2008)	No suitable habitat within the survey area (Ecoedge, 2022)
Dwarf Hammer-orchid (*Drakaea micrantha*) – Vulnerable	Occurs in infertile grey sands, in Banksia, Jarrah (*Eucalyptus marginata*) and Common Sheoak (*Allocasuarina fraseriana*) woodland or forest. It is often found under thickets of Spearwood. It is usually found in cleared fire breaks or open sandy patches that have been disturbed, where competition from other plants has been removed. (DEWHA, 2008)	No suitable habitat within the survey area (Ecoedge, 2022)

The sampling design and survey effort was appropriately scaled to provide a high degree of confidence in the results. Coverage of the survey area was completed as recommended in the *Draft Survey Guidelines for Australia's Threatened Orchids* (DEC, 2013). The proposed project area is relatively small and easy to traverse, and so the entire survey area was mapped.

For the 2018 survey, high quality aerial photographs were used in its design. Parallel transects at 10m (equating to a 5m search area either side of the walked transect) were traversed throughout the entire survey area. The survey area extended beyond the proposed project footprint, extending into the 20m buffer zone from the Banksia Woodland TEC to the north of the extraction area. No major disturbance event had occurred within the survey area that may have affected the results of the survey and no other limitations were noted.

The second and third targeted orchid species surveys in 2022 incorporated an approach where the entire 2.33ha of clearing proposed was traversed over the two surveys. The area was much smaller than the original survey and easy to traverse as it is so highly degraded with very little understorey. The surveys concluded that no orchids were identified within the proposed extraction area.

4. Listed Threatened Species and Communities

4.1. Black Cockatoos

Significance criteria of impacts refer to 'populations' and 'important populations' (DEWHA, 2013). These terms have not been defined for black cockatoos due to the mobile and widely distributed nature of these species, and the variation in flock compositions (for example, between breeding and non-breeding seasons). For black cockatoos, it is more appropriate to consider significance in terms of impacts on habitat rather than a resident population (DSEWPaC, 2012).

The proposed action involves the clearing of up to 2.33ha of potential breeding habitat including 27 potential black cockatoo breeding habitat trees for the three species of black cockatoo, which are recorded to occur within the region:

- Carnaby's Black-Cockatoo *(Calyptorhynchus latirostris)* – Endangered
- Baudin's Cockatoo *(Calyptorhynchus baudinii)* – Endangered
- Forest Red-tailed Black Cockatoo *(Calyptorhynchus banksii naso)* (FRTBC) – Vulnerable

Carnaby's Black Cockatoo – *Calyptorhynchus latirostris*

Family	Psittacidae
Conservation Status	Endangered under the EPBC Act 1999. The term 'endangered' is defined as a threatened species considered to be facing a very high risk of extinction in the wild. This species is also listed as Endangered under the Wildlife Conservation Act 1950 of Western Australia.
Likelihood of occurrence	Known to occur. Confirmed roosting sites recorded 3.5km to the south and 1km to the north-east of the project site, with no confirmed breeding sites recorded.
Distribution	Distribution extends north to Perth and east to Wundowie, Mount Helena, Christmas Tree Well, North Bannister, Mount Saddleback, Rocky Gully and the upper King River. They are also found on parts of the Swan Coastal Plain (DSEWPAC, 2012)
Breeding Season	Carnaby's cockatoo breeds from July/August to January/February.
Breeding Habitat	Carnaby's cockatoo nest in the wheatbelt in hollows of live or dead eucalypts, primarily the smoothbarked salmon gum (*Eucalyptus salmonophloia*) and wandoo (*Eucalyptus wandoo*) (Saunders 1979), though breeding has been reported in other wheatbelt tree species and some tree species on the Coastal Plain and jarrah forest (Saunders 1979; Storr 1991; Johnstone and Storr 1998). Success in breeding is dependent on the quality and proximity of feeding habitat within 12 km of nesting sites (Saunders 1977, 1986; Saunders and Ingram, 1987). There has been an apparent expansion in the breeding range to include areas further west and south since the middle of last century with a more rapid increase in the past 10-30 years into the jarrah-marri forests and the coastal tuart forests south of Perth (Johnstone and Storr, 1998; Johnstone et al., 2011). Some non-breeding birds remain in non-breeding areas all year round.
Feeding Habitat	During the non-breeding season (January to July) the majority of

	the birds migrate to the higher rainfall coastal regions of their range in the midwest coast, Swan Coastal Plain and south coast. Marri seeds are a major food of Carnaby's black cockatoo (TSSC, 2016). Also feeds on jarrah (*Eucalyptus marginata*) in south-west forests and blackbutt (*E. patens*), Albany blackbutt (*E. staeri)*, sheoak (*Allocasuarina fraseriana)*, and snottygobble (*Persoonia longifolia)*. candlestick banksia (*Banksia attenuata*) seeds and the weevil larvae in the fruiting cones are an important food source. Non-indigenous food sources include native spotted gum (*E. maculata)* and Cape lilac (*Melia azedarach)* on the Swan Coastal Plain.

Key Considerations of this Species

There are a number of threats that have contributed to the decline in population numbers of Carnaby's black cockatoo including habitat loss due to clearing and urbanisation, habitat degradation and competition for hollows from other birds and feral bees.

Carnaby's black cockatoo mostly breed in the wheatbelt and require corridors of Banksia and Eucalyptus species for resting and feeding in their longer daily journeys to seasonal foraging areas on the Swan Coastal Plain (DPAW, 2013).

Habitat critical to survival of Carnaby's cockatoo includes suitable woodland breeding habitat with tree hollows and nearby feeding habitat, and foraging habitat with available night roosts.

Carnaby's cockatoos are dependent on water being available in the vicinity (within 12 km) of roosting sites (Shah, 2006; Johnstone and Kirkby, 2008; Burnham et al., 2010).

Some non-breeding birds remain in non-breeding areas all year round in areas that have better natural water sources over the summer period and proteaceous woodlands and shrublands for foraging.

Carnaby's black cockatoo typically prefer long unburnt (10-30 years since the last fire) natural areas.

Baudin's Black Cockatoo - *Calyptorhynchus baudinii*

Family	Psittacidae
Conservation Status	Endangered under the Commonwealth EPBC Act 1999. Endangered under the *Wildlife Conservation Act 1950* of Western Australia.
Likelihood of Occurrence	Known to occur
Distribution/DWER Districts	Baudin's cockatoo occurs in temperate forest and woodland dominated by jarrah (*Eucalyptus marginata)*, marri *(Corymbia calophylla)* and karri *(E. diversicolor*) in the following districts: Swan Coastal, Perth Hills, Narrogin, Katanning, Albany, Frankland, Donnelly, Blackwood, and Wellington.
Breeding Season	August/September to February/March
Breeding Habitat	The species nests in the hollows of mature eucalypts, particularly marri, karri, jarrah, wandoo *(E. wandoo*), tuart *(E. gomphocephala*) and bullich *(E. megacarpa*) (Johnstone et al. 2010, WAM 2017). Analyses show that trees with hollows large enough for use by Baudin's cockatoo may be between 200 and 500 years of age (Johnstone et al. 2002). Breeding occurs in the south-west of the species range bounded by Leschenault (near Bunbury), Collie (inland east of Bunbury) and Albany

	(DSEWPaC 2012). Breeding has also been recorded north of this area at Perth Hills, Harvey (BirdLife International 2016), Lowden (Johnstone & Storr 1998), Serpentine (hills area), and to the east at Kojonup (Johnstone & Kirkby 2008). Old-growth jarrah-marri forest with suitable hollows for Baudin's cockatoo now only occur in severely fragmented stands.
Feeding Habitat	The species mainly feeds on the seeds and flowers of marri in the forested regions of the south-west, the seeds of the Proteaceous *Banksia grandis, B. littoralis, B. ilicifolia, Hakea undulata, H. prostrata, H. trifurcata*, and *Dryandra* spp., as well as *Erodium botrys*, jarrah and insect larvae. It also feeds on apple and pear seeds in orchards.

Key Considerations of this Species

Baudin's cockatoo has undergone substantial long-term decline in population size and range. Nest hollow shortage is a principal threat to Baudin's cockatoo (TSSC, 2018). Primary threatening processes that contribute to nest hollow shortage are land clearing, fire events, competition with invasive and native species and habitat modification due to phytopathogens and climate change.

Forest Red-tailed Black Cockatoo– *Calyptorhynchus banksii naso*

Family	Psittacidae
Conservation Status	Vulnerable under the Commonwealth EPBC Act 1999 and vulnerable under the Wildlife Conservation Act 1950 of Western Australia. It is a threatened species considered to be facing a high risk of extinction in the wild.
Likelihood of Occurrence	Known to occur
Distribution	Humid and sub-humid forests of southwest WA, mainly in the hilly interior. Distribution extends north to Perth and east to Wundowie, Mount Helena, Christmas Tree Well, North Bannister, Mount Saddleback, Rocky Gully and the upper King River. They are also found on parts of the Swan Coastal Plain. The forest red-tailed black cockatoo inhabits the dense jarrah, karri and marri forests receiving more than 600mm of annual average rainfall (Saunders et al., 1985; Saunders and Ingram, 1995).
Breeding Season	The forest red-tailed black cockatoo is thought to breed in October/November, but in years with good autumn rainfall they may breed in March/April.
Breeding Habitat	The species nests high in the hollows of mature eucalypts, particularly marri, karri, and jarrah, and may only breed in years when marri is fruiting in abundance. Lately some breeding has been recorded in artificial hollows (Kaarakin, 2020).
Feeding Habitat	The species is a canopy feeder that feeds predominantly on marri and jarrah and occasionally blackbutt (*E. patens)*, Albany blackbutt (*E. staeri)*, sheoak and snottygobble. It also feeds a wide variety of non-native trees such as Cape lilac, olives, liquid amber, lemon-scented gum, sweet introduced tree fruits and rosewood on the Swan Coastal Plain (Kaarakin, 2020).

Key Considerations of this Species

Nest hollow shortage is a principal threat to FRTBC (TSSC, 2018). Analyses show that trees with hollows large enough for use by FRTBC cockatoo are becoming increasingly rare (Johnstone et al. 2002). Primary threatening processes that contribute to nest hollow shortage are land clearing, fire events, competition with invasive and native species and habitat modification due to phytopathogens and climate change.

4.2. Western Ringtail Possum (*Pseudocheirus occidentalis*)

Western Ringtail Possum *Pseudocheirus occidentalis* – Critically Endangered (BC/EPBC Act)
Not recorded during the survey period despite targeted day and night surveys. Known to occur in the general area though it appears to be more commonly encountered west of Forrest Highway. Listed as a potential species based on available information.

Family	Pseudocheiridae
Conservation Status	Critically endangered under *EPBC Act 1999* (Commonwealth), *BC Act 2016* (WA), IUCN Red List
Likelihood of Occurrence	Potential to occur
Description	WRP is a nocturnal marsupial to 1.3 kg in weight and approximately 40 cm in body length. The fur is dark brown above with cream to grey fur underneath. The tail has a white tip and grows to 41 cm long (Australian Government 2009). WRPs breed once or occasionally twice a year giving birth to one to three off springs. Breeding can occur any time of the year, but most common in autumn (April-June). Their lifespan is three to five years on average in the wild.
Distribution	Once widely distributed across southern and south-western WA and now restricted to patches in forests and woodlands with records from only three areas. Due to the scattered distribution, surveys are difficult and estimates on population details are unknown.
Habitats	WRPs are arboreal and spend most of their time in trees. Their habitats are typically located close to water courses, swamps or on floodplains (Jones et al. 1994). The highest density populations are generally found in mature peppermint (*Agonis flexuosa*) remnants.

Key Considerations of this Species

WRP populations predominately occurs in peppermint forest and woodland and tuart (*Eucalyptus gomphocephala*) forest with a peppermint understorey. Areas with an understorey containing *Lepidosperma spp*. are also important habitat areas for WRPs. Young and vigorous peppermint trees are identified as an important nutritional source for the WRPs and both intact habitat patches and vegetation remnants are considered important.

WRPs populations of the southern Swan Coastal Plain face a range of threats, with habitat loss and fragmentation as a result of clearing being the most extensive major threat to populations. Other key threats include increased predation by foxes and cats, particularly where there is reduced

understorey cover; altered fire regimes resulting in changes to habitat quality; and competition with brushtail possum (*Trichosurus vulpecula*) for resources (DEWHA, 2009).

4.3. Conservation Significant Orchids

Descriptions of each of the conservation significant orchids identified as having a potential for occurring in the region are described below:

Carbunup King Spider Orchid (Caladenia procera)

Family	Orchidaceae
Conservation Status	*Caladenia procera* is listed as Critically Endangered under the Commonwealth EPBC Act. *Caladenia procera* is listed as Critically Endangered under the Biodiversity Conservation Act 2016.
Known local occurrence	Not found within the proposed project area. *Caladenia procera* has been known to occur within 10km of the area, however no suitable habitat exists in the project area.
Description	*Caladenia procera* is an orchid that grows to approximately 70cm tall, and has a single, pale green leaf that is 10-30cm long and 6-10mm wide. Each plant bares 1-3 spider-like flowers that feature a greenish lemon yellow with lines and spots of dark maroon to pink. The above ground parts grow typically from March to late November, with flowering between September and October. The plant dies back to a dormant underground tuber over summer.
Distribution and Habitat	*Caladenia procera* is endemic to a small area southwest of Busselton. The species grows in Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Peppermint (*Agonis flexuosa*) woodland on alluvial sandy-clay loam flats, with Mangles Kangaroo Paw (*Anigozanthos manglesii*) amongst dense heath and sedges or low dense shrubs.

Glossy-leafed Hammer Orchid (*Drakaea elastica*)

Family	Orchidaceae
Conservation Status	*Drakaea elastica* is listed as Endangered under the Commonwealth EPBC Act and is listed as Critically Endangered Biodiversity Conservation Act 2016.
Known local occurrence	*Drakaea elastica* has been previously within 10km of the site however the habitat within the project area is too degraded.
Description	*Drakaea elastica* is a small orchid with a single distinctively glossy, bright green, prostrate, round to heart shaped leaf, 1 to 2 cm in diameter. The leaf emerges in May and starts to wither by the time the orchid flowers in September. The single flower, on a slender flowering stem to 30cm high, is 3 to 4cm long with a hinged hammer-like lip (labellum). The two other petals and all three sepals are small and slender. Flowers are first seen in late September, extending to October and rarely early November. However, it is important to note that each plant may not flower every year. The plant dies back to a

dormant underground tuber over summer. The best time to look for the plant is in July and August when the glossy-green leaves are relatively conspicuous.

Distribution and Habitat *Drakaea elastica* is currently known only from the Swan Coastal Plain over a range of approximately 350km between Cataby in the north and Busselton in the south. The species grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, typically in *Banksia* (*Banksia menziesii, B. attenuata* and *B. ilicifolia*) woodland or Spearwood (*Kunzea glabrescens*) thicket vegetation.

Tall Donkey Orchid (*Diuris drummondii*)

Family Orchidaceae

Conservation Status *Diuris drummondii* is listed as vulnerable under the EPBC Act and is also listed as Vulnerable under the Biodiversity Conservation Act 2016.

Known local occurrence Not found within the proposed project area. It has been recorded within 10km of the project site, however the project area does not contain wetlands and is too dry to support *Diuris drummondii*.

Description *Diuris drummondii* is the tallest donkey orchid endemic to south-west Western Australia. It grows to a height of 105cm and produces 3 to 8 widely spaced pale yellow flowers (3 – 4.5cm long and 2.3-3.5cm wide). The petals are held ear-like above the rest of the flower with the blade 17–20 mm long and 10–13 mm wide on a blackish stalk 6–8 mm long. Flowering occurs from November to January and is enhanced by fire the previous summer followed by heavy winter rains

Distribution and Habitat *Diuris drummondii* grows in winter-wet depressions in sandy clay and peaty swamps, that retain at least some moisture until summer. It often flowers with its base submerged. It is known from 12 populations between Perth and Walpole.

Dwarf Bee Orchid (*Diuris micrantha*)

Family Orchidaceae

Conservation Status *Diuris micrantha* is listed as Vulnerable under the EPBC Act and Vulnerable under the Biodiversity Conservation Act 2016.

Known local occurrence Not found within the proposed project area, site too degraded. A specimen of *Diuris micrantha* has previously been located with 10km of the proposed project area.

Description *Diuris micrantha*, has a basal tuft of narrow, linear leaves and a loose, slender inflorescence up to 60cm high. The yellow flowers, which can number up to seven, have reddish-brown markings and are the smallest in the genus, measuring up to 1.3cm across. Flowers appear from August to early October.

Distribution and Habitat	*Diuris micrantha* is known from seven populations, from east of Kwinana and south towards the Frankland area, Western Australia. It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps.

Dwarf Hammer Orchid (*Drakaea micrantha*)

Family	Orchidaceae
Conservation Status	*Drakaea micrantha* is listed as vulnerable under the EPBC Act and Endangered under the Biodiversity Conservation Act 2016. It is also currently listed on Appendix II of the Convention on International Trade in Endangered Species (CITES).
Known local occurrence	Not identified within the proposed project area, site too degraded. *Drakaea micrantha* has been previously located within 10km of the proposed project area.
Description	*Drakaea micrantha* is a tuberous, terrestrial herb which has a flower 1.2cm to 2.5cm long, on a stem up to 30cm high. Its heart-shaped leaf is silvery-grey with prominent green veins (DEWHA, 2018).
Distribution and Habitat	*Drakaea micrantha* is known from 32 small, scattered populations over a wide area from Perth to Albany, Western Australia. The species is usually found in cleared fire breaks or open sandy patches that have been disturbed, and where competition from other plants has been removed. *Drakaea micrantha* occurs in infertile grey sands, in *Banksia*, jarrah and common sheoak (*Allocasuarina fraseriana*) woodland or forest. It is often found under thickets of Spearwood (*Kunzea ericifolia*).

Assessment of Potential Impacts to Conservation Significant Orchids

The proposed action is considered unlikely to pose a significant threat to populations of *Caladenia procera*, *Drakaea elastica*, *Diuris drummondii, Diuris micrantha*, or *Drakaea micrantha* as these species are not considered to be present within the proposed extraction area. The habitat present is not suitable for these species as it is highly degraded due to grazing and firewood collection activities (as listed in Table 9). In three separate flora surveys, targeting the five conservation species orchids, none were found, with no evidence of suitable habitat that will support the conservation significant species establishment.

5. Potential Impacts of the Project

5.1. Assessment of Potential Impacts to Black Cockatoos

Direct Impacts

Direct impacts effected by the clearing of 2.33ha of native vegetation will include:

- Loss of vegetation / habitat that may be used for breeding.
- Death or injury of fauna during clearing and excavation.
- Contributing to the competition for hollows by making water available to bees.

Loss of breeding and roosting habitat

The proposed project area is located within the modelled breeding range for Carnaby's black cockatoo, Baudin's black cockatoo and the Forest red-tailed black cockatoo (DAWE, 2022).

The black cockatoo habitat tree assessment over the project area identified a total of 27 trees with a DBH of ≥ 50cms. 10 of the trees were observed to contain hollows, however none of the hollows were considered by the surveying zoologist to be of suitable size for black cockatoos for nesting purposes. No evidence of black cockatoo activity was observed within the project area (Harewood, 2018; LEC, 2021)

Carnaby's black cockatoo mainly breeds in the wheatbelt, primarily in the smooth-barked salmon gum and wandoo tree species (DPAW, 2013), as the proposal site does not feature many habitat trees and none that offer suitable habitat for Carnaby's black cockatoo, the impact of loss or degradation of breeding sites (or foraging habitat within 12km of breeding sites), is low for Carnaby's black cockatoo.

Forest red-tailed black cockatoo breeding habitat typically comprises large and old marri trees greater than 200 years old (Johnstone, Kirkby and Sarti, 2013). The few marri trees within the project area have not reached a maturity where they offer suitable hollows for Forest red-tailed black cockatoos.

Baudin's cockatoos tend to like trees greater than 100 years of age that have hollows with a diameter of 30-40cm and more than 30cm deep (DPAW, 2019). Only 10 of the habitat trees identified in the site survey had hollows and none of these were deemed suitable for cockatoo nesting.

The likelihood of significant impacts from a reduction in breeding hollows and roosting habitat for all three species is considered to be very low as none of the sparse habitat trees within the clearing footprint identified had hollows large enough for black cockatoos and there was no evidence of cockatoo use observed within the footprint.

Loss of foraging habitat

The clearing proposed for the extraction area is comprised of *Agonis flexuosa* dominated woodland and therefore does not offer significant foraging habitat for black cockatoos. No evidence of black cockatoos utilising the vegetation in this area for foraging was observed during field surveys (Harewood, 2018; LEC, 2020).

Loss of dispersal habitat

The proposed clearing area is not considered dispersal habitat as it is not linking patches of breeding or foraging habitat there are no impacts to dispersal habitat as a result of this proposal.

Competition for hollows by feral bees

It is unlikely there will be a significant increase in the abundance of feral bees as a result of the proposal as there is unlikely to be an increase in available water due to the extraction activities, with water only being applied to the area when required for dust suppression.

Death or injury during clearing

Death or injury to black cockatoos during clearing would normally only occur during breeding season as adults of the species are highly mobile. Clearing of 2.33ha of vegetation will be scheduled to occur between April and August to avoid the black cockatoo breeding season, however the lack of evidence of use in the 2018 and 2022 Fauna surveys suggest it is further unlikely there will be black cockatoo injury or death.

A fauna relocation program will be implemented prior to and during clearing works, to ensure direct impact on fauna is minimised. The proponents have developed a Fauna Management Plan (Appendix J) to be implemented during clearing works. It should be noted that this Fauna Management plan refers to a larger footprint than is currently planned, but all actions proposed will nevertheless be implemented as described in it. This plan includes having a qualified fauna handler on-site during clearing works to facilitate the safe handling, assessment and relocation of any fauna impacted during the clearing works.

Indirect Impacts

Indirect impacts that may potentially cause loss or degradation of the surrounding black cockatoo habitat include:

- Noise;
- Increased vehicular movement and potential for injury/death; or
- Impacts to surrounding vegetation caused by:
    - The spread or introduction of weeds.
    - modification of surface hydrology.
    - changes to fire regimes.
    - pollution (e.g. oil spills).
    - spread of plant pathogens (dieback).

Noise

Black cockatoos are frequently observed in urban environments and have adapted well to the noise and movement of human developments. There are large areas of feeding habitat used by Carnaby's black cockatoo in the metropolitan Perth and Peel regions (DPAW, 2013). The adaptive behaviour of black cockatoos, in addition to the ample surrounding vegetation that may be utilised as a refuge during excavation work hours, and existing extraction operations on the property, make it unlikely that noise will have a detrimental impact on black cockatoos.

Vehicle strike

Machinery and working vehicles generally move at low speeds within excavation areas and on specific access tracks to minimise vehicle disturbance to the surrounding environment. All

equipment is inspected via prestart prior to start up, which prevents fauna being injured if it is residing in/under the vehicle. During the existing extractive operations on the property no incidents of vehicle strike to black cockatoos or other fauna on the property has occurred as a result of these operations.

Impacts to surrounding vegetation

Weed spread and establishment is managed as part of the environmental management actions undertaken by the property owner and proponent. These management activities include annual monitoring and herbicide application as required.

Groundwater occurs at depths below the proposed extraction depth and surface water runoff is designed to be limited to the extraction footprint to prevent impacts to surrounding vegetation. The proposal will not impact water availability for black cockatoos.

Fire regimes will remain the same and existing operational controls and practices to prevent pollution and spread of pathogens will be continued to prevent impact to the surrounding vegetation.

5.2. Assessment of Potential Impacts to Western Ringtail Possum

Direct Impacts

Direct impacts effected by the clearing of 2.33ha of native vegetation will include:

- Habitat Loss
- Increased competition in adjacent refuge vegetation
- Death or injury of fauna during clearing and excavation

Habitat loss

The proposal requires the loss of 2.33 ha of highly degraded potential western ringtail possum habitat. Even though no western ringtail possums were recorded during the fauna survey (Harewood 2018), the plant community (*Agonis flexuosa* woodland) is a recognised potential habitat for WRP and therefore clearing this vegetation is considered a loss of potential WRP habitat.

The proposal will not increase fragmentation of WRP as remnant vegetation forms a contiguous envelope around the proposal site, including a large 13.5ha conservation covenant within the property.

Increased competition in adjacent refuge vegetation

Activity from the common brushtail possum (*Trichosurus vulpecula*) was observed in vegetation to the direct north of the proposed extraction site. Competition between brushtail and WRP are known to occur, however it has also been found that a site which supports a very high-density population of western ringtail possums also supports a brushtail possum population (DEWHA, 2009). The vegetation to the north of the proposed site does offer a more intact understorey as well as *Agonis flexuosa* and large eucalypt habitat trees. This vegetation is well established and in better condition than the proposed clearing site.

With the lack of WRP activity within the proposed clearing site along with the high value habitat occurring directly adjacent the site, the potential for this project to increase competition in adjacent refuge vegetation is considered very low.

Death/Injury during clearing and excavation operations

There is the potential of an individual WRP being injured or killed during clearing or excavation operations by machinery. However, given the lack of evidence of WRP activity within the proposed extraction site, and that the proponent has undertaken similar clearing and extraction operations on the property with no incidents involving the injury or death of WRP, it is considered highly unlikely operations will cause death or injury of WRP.

The proponents have developed a Fauna Management Plan (Appendix J) to be implemented during clearing works. This plan includes having a qualified fauna handler on-site during clearing works to facilitate the safe handling, assessment and relocation of any fauna impacted during the clearing works.

Indirect Impacts

Indirect impacts that may potentially cause loss or degradation of the western ringtail possum habitat include:

- Noise;
- Increased predation due to increased human activity
- Decline in condition of surrounding habitat

Noise

Western Ringtail Possums have adapted well to the noise and movement of human developments. As there is ample surrounding vegetation and existing extraction operations occurring on the property, it is expected possums will self-relocate to the surrounding remnant vegetation if disturbed and unlikely noise will have a detrimental impact on the WRP populations.

Increased predation due to increased human activity

Possums are also known to descend to the ground more frequently when habitat linkages are fragmented (e.g. discontinuous overstorey), increasing their risk from ground predators (DEWHA, 2009). The vegetation proposed to be cleared has already been highly degraded due to historic fire, firewood collection and grazing practices. There has also been extractive industry operating on the property for more than decade.

Given similar activity is already occurring at this location, the impact of this proposal on increasing predation of WRP by foxes and cats is considered to be very low.

Decline in condition/value of adjacent habitat

Vegetation adjacent to the project site includes potential WRP habitat. Unmanaged the proposal has potential to cause a decline in the condition of adjacent WRP habitat due to impacts of noise emissions and dust deposition during clearing and extraction operations. There is also the risk of increased spread of weeds and pathogens.

Similar clearing and extractive operations have been undertaken on the property since 2000. The management practices undertaken on the property have appeared to be sufficient in protecting adjacent vegetation from being impacted.

Current operations include controls for preventing decline in the adjacent vegetation such as weed and pathogen spread, fencing the site, having a single access point, applying water as required for dust mitigation and limiting operations times to limit noise. For this reason, it is unlikely that this proposal will lead to a decline in condition or value of the adjacent WRP habitat.

5.3. Assessment of Potential Impacts to Conservation significant orchids

With no conservation significant orchids occurring within the proposed disturbance footprint there is no direct or indirect impact due to this proposal to these species and therefore it does not comprise a controlled action.

6. Application of the Mitigation Hierarchy

The EPBC Act Environmental Offsets Policy 2012 (DSEWPC, 2012) identifies that avoidance and mitigation actions should be the primary strategies for managing the potential environmental impacts of a proposed action. Carbone Bros have applied the mitigation hierarchy during planning of the proposed project, with measures to avoid and reduce impact to the surrounding environment and in particular MNES being applied to the greatest extent practicable. Residual impacts have then been addressed through the development of the offset proposal discussed in Section 9.

6.1. Impact Avoidance

The proponent recognises that although there is valuable sand resource available throughout Lot 5 Wellesley Road, there is also conservation significant remnant vegetation, within the site, that has a high value to the Shire of Harvey and provides habitat to the local black cockatoo and WRP communities.

In respect of these environmental values, the proponent chose to substantially reduce the extraction area from 5.18ha to 3.4ha (with only 2.33ha of clearing now required). This reduction in proposed disturbance footprint avoids completely 2.85ha of remnant Banksia woodland TEC and demonstrates the proponent's willingness to avoid impact where practicable, despite losing access to profitable sand resource.

6.2. Impact Reduction

Where impact cannot be avoided, the indirect impacts to surrounding vegetation will be reduced through the containment of operations to the approved disturbance footprint.

This will be managed through implementing controls such as pegging and fencing of the extraction footprint prior to operations occurring, utilising a fauna spotter/handler during clearing, applying dust suppression during clearing and extraction, conducting regular weed management throughout operations, providing dieback information to contractors and customers and limiting access to a single point in and out of the site.

Specific measures that will be implemented to protect MNES are described in Table 10.

Table 10. Avoidance and Mitigation Measures

AVOIDANCE				
The proponent chose to substantially reduce the extraction area from 5.18ha to 3.4ha (with only 2.33ha of clearing now required). This reduction in proposed disturbance footprint avoids completely 2.85ha of the highest conservation value (Banksia woodland TEC to the north having conservation significant to faunas including Black Cockatoos and Western ringtail possum).				
MITIGATION				
Management Action	**Interim Criteria**	**Completion Criteria**	**Roles and Responsibilities**	**Monitoring/ Reporting**
Prior to and During clearing				
• Preparation and approval of EIL EMP and associated management plans including Dust and Weed management and the Dieback brochure. • Assessment of site by a qualified fauna handler to determine best options for relocation of fauna during clearing and treatment for any injured. • Vegetation will be inspected for fauna prior to clearing to prevent injury and death to fauna residing in it including western ringtail possum and black cockatoos. • A list of local wildlife rescue organisations and carers will be maintained on site to contact in the event of fauna injury. • Demarcation of areas to be cleared with flagging and site manager to ensure all contractors involved in clearing are aware of the relevant site plans and limits for clearing. • Clearing to be planned to occur between April and August to avoid the black cockatoo breeding season.	Associated plans prepared and approved. Clearing area is visually demarcated prior to clearing starting Contractors involved in clearing briefed on fauna injury prevention controls and protocols if encountered. Preclearing fauna assessment to occur before every clearing campaign.	• All plans regarding the site and offset are final and available to all relevant contractors to adhere to. • Vegetation outside of the project area is not disturbed • A qualified fauna handler has been contracted to provide their services for the clearing. • Clearing is clearly demarcated and conducted between April and August • Any protected species injured or killed during clearing are reported to authorities.	• LEC to prepare relevant management plans and provide them for govt approvals where required. • Fauna management plan to be prepared and implemented by a Zoologist. • Site manager to ensure all information within the management plans is implemented on site and communicated to personnel and contractors. • Contractors involved in clearing to be familiar with the relevant management plans, demarcation used and site plan showing area to be cleared. • Fauna assessment, handling and relocation to be undertaken by an experienced zoologist.	• Annual Compliance Report as per Shire's Planning Conditions. • Annual compliance Report as per DWER clearing permit condition. • Annual Environmental Reporting as per DWER Licence requirement for prescribed premises. • Annual EPBC compliance report as per DCCEEW EPBC Act Approval (once approved). • Report detailing any fauna injured, killed or relocated during clearing, along with their final relocation coordinates is provided to the proponent and authorities (where relevant) by the Fauna Handling contractor.

Management Action	Interim Criteria	Completion Criteria	Roles and Responsibilities	Monitoring/ Reporting
Construction				
• Unauthorised access to Lot 5 will be prevented through signage at the access gateway and exclusion fencing. • 'No entry' signage is placed at access points. • Environmental inductions will be given to site staff and contractors to ensure environmental obligations are understood. • Plant and Equipment will be inspected by the contractor prior to entry at the work site and be confirmed to be clean and free of vegetation and soil material. • Stormwater is to be contained within the site to ensure no impact to hydrology outside of the disturbance footprint.	• Fencing and signage around the boundary will be installed prior to earthworks commencing • Induction records available • Clean-down records available • No evidence of vehicles and machinery operating off dedicated roads and work fronts • No evidence of erosion from construction footprint into adjacent land or vegetation.	• There will be no decline in condition of or impact to adjacent vegetation as a result of the project. • Site perimeter fence is intact. • No new Dieback infestation impacting adjacent vegetation • No impact from stormwater run-off to land outside of footprint • No evidence of the establishment of declared weeds within or adjacent to the site • The level of weeds is not detrimental to the surrounding native vegetation	Site manager will: • Maintain records of inductions and communications to staff, contractors and visitors • Respond to and report any incidents or non-compliances. • Enforce dieback inspections before entering and leaving site. • Ensure there is no damage external to the site caused by run-off or dust emissions. • Ensure fencing and access control is intact. • Environmental consultant will conduct annual compliance check.	• Annual Compliance Report as per the requirement of the Shire EIL approval. • Annual compliance as per DWER clearing permit reporting. • Annual Environmental Reporting as per DWER Licence requirement for prescribed premises. • Annual EPBC compliance report as per DCCEEW EPBC Act Approval (once approved).

Management Action	Interim Criteria	Completion Criteria	Roles and Responsibilities	Monitoring/ Reporting
Operations				
Weed & Dieback management • Weed emergence will be monitored on a 6 monthly basis (ie. After first seasonal rains and at the end of spring) by an experienced and licenced weed management contractor. • If a weed infestation occurs the licenced weed management contractor will apply the appropriate method of control for the species identified and site conditions. • All records of weed treatment will be maintained by the weed contractor • All plant and equipment will be inspected prior to entry to ensure it is free of vegetation and soil material	• No evidence of declared weeds within the project site • Weed treatment is being applied • Ground cover is no more than 20% weeds at any time throughout the project. • Clean down records available • A site inspection shows no signs of Dieback infestation at year 3 following rehabilitation commitments	• The condition of vegetation adjacent to the proposal area is maintained. • There are no new weed infestations or dieback in the adjacent vegetation attributable to operations • A site inspection or report from licenced weed management contractors shows weed cover is no more than 20% at year 5 following rehabilitation commitments. • A site inspection shows no signs of dieback infestation at year 5 following rehabilitation commitments.	Site manager will: • Respond to any suspected weeds and engage weed contractor • Enforce dieback inspections before entering and leaving site. • Environmental consultant will conduct annual compliance check.	• Annual Compliance Reporting to Shire, DWER and DCCEEW. • Reporting to DAF if declared weeds are identified
Fauna injury prevention • Perimeter of site will be fenced • If left overnight, vehicles and machinery will be parked up within the fenced site away from remnant vegetation. • Vehicles and machinery will be checked for fauna as part of prestart inspections • Speed limits of 40km/hr will be applied throughout the project site	• Prestart checks occurring for vehicles and machinery on site • Site fence intact or repaired as needed	• Fauna is not injured or killed as a result of operations • If found on site fauna is relocated as per the fauna management plan. • If found injured, a local wildlife carer is contacted.	Site manager is responsible for: • enforcing prestart inspections • ensuring fauna incidents are reported and managed appropriately • ensuring injured fauna is handed to a registered wildlife carer. Operational staff and contractors must: • Conduct prestart inspections • Adhere to speed limits • Report any fauna encountered on site.	• Annual Compliance Reporting • Incident reporting to authorities if fauna is found injured or killed as a result of operations

Management Action	Interim Criteria	Completion Criteria	Roles and Responsibilities	Monitoring/ Reporting
Noise Minimisation • Excavation and loading operations will be limited to daylight hours (7.00a.m. – 5.00p.m., Monday to Friday and 7.00a.m. – 12.00 noon on Saturday. No activities on Sunday or Public Holidays). This minimises the duration of operational noise that can impact the surrounding habitat and fauna.	• Operations adhere to restricted times (as per Development Approval)	• No complaints about noise or operations occurring outside of restricted hours	• Site manager to ensure operations adheres to time restrictions and record any complaints.	• Annual Compliance reports
Dust Mitigation • The proponent will implement their dust management plan to mitigate dust on site. This includes using water carts, as needed, to reduce dust generated during excavating or loading. • Vehicle speeds will be limited to 40 km/hr or under on site to reduce dust generated by vehicles in transit. • Where conditions are deemed by the site supervisor to be too windy or likely to lead to high dust generation, dust-generating works will cease until the site manager deems it safe to continue.	• Dust is suppressed on site as required. • Vehicle speed limits are adhered to.	• No evidence of dust deposition on adjacent vegetation	Site manager to: • Enforce vehicle speed limits • Provide sufficient dust suppression/ water resource to ensure dust is minimised. • Assess weather and cease works if required. Staff, contractors and visitors are to adhere to the dedicated access routes and speed limits	• Annual Compliance reports
Water Quality Protection • Water required for dust suppression will be sourced from commercial outlets. • The extraction will not intercept groundwater, with the pit base at least 20m from groundwater level and no water abstraction is required. • Stormwater runoff will be contained within the base of the extraction pit, with no surface water runoff to be discharged to the	• Any spills that occur on site are cleaned up immediately, reported and recorded • Spill kit is available on site and stocked • Site is designed to contain surface water runoff	• No evidence of run-off or erosion into adjacent vegetation • Spill incidents recorded • No evidence of contamination to ground or water.	• Ensure staff and contractors are aware of responsibilities to protect water quality • Ensure appropriate resources are available to enable safe refuelling onsite and clean up of spills • Maintain spill incident records • Ensure drainage is	• Annual Compliance reports

surrounding environment. • Refuelling will take place using a service vehicle equipped with "snap-on-snap-off", fast fill and auto shut off. No fuel and lubricants will be stored on site. • No major servicing that could lead to hydrocarbon spills will take place on site. • A hydrocarbon spill kit will be available on site at all times. • Herbicides will only be used as required and preference will be given to those that have low potential to leach into groundwater.			appropriate for site	
Fire • All vehicles, plant and equipment will be fitted with fire extinguishers and restricted to designated operations. • Fire danger ratings and Shire vehicle movement bans will be adhered to. • Fire breaks will be monitored and maintained in accordance with the *Bush Fire Act 1954.* • The proponent will cooperate with the Department of Biodiversity Conservation and Attractions (DBCA) in carrying out controlled burns if and when necessary.	• Records showing ongoing upkeep of firebreaks, and management of fuel loads	• Site inspection confirms upkeep of firebreaks at Year 5. • No incidents of fire as a result of operations on site	• Site manager to ensure fire management actions are implemented throughout operations • Site manager to inspect fire breaks and ensure they are maintained in line with the Shire firebreak notices.	• Annual Compliance reports
Rehabilitation • The use of fertilisers during rehabilitation will be made in consultation with the DPIRD. • The land surface will be recontoured with perimeter batters graded to a maximum of 1:3 (rise over run). • The footprint will be ripped after completion of the extraction and rehabilitated pasture, securing the soil insitu. • Rehabilitation will be monitored until established, to ensure any potential for		• A site inspection or report from licenced weed management contractors shows weed cover is no more than 20% at year 5 following rehabilitation commitments. • A site inspection shows no signs of	• Site manager will be responsible for the adherence to rehabilitation plan • Site manager will respond to and report any incidents. • Environmental consultant will conduct annual compliance as per compliance requirements.	• Annual Compliance reports

erosion is managed.		dieback infestation at year 5 following rehabilitation commitments.		

7. Rehabilitation

The proponent plans to progressively rehabilitate the 3.4ha project site to grazing pasture once as extraction is completed. The objective of rehabilitation for this project is to establish a *stable landform and a self-sustaining pasture grass cover* with a minimal amount of weed species. This objective will be attained through confirmation that the compliance criteria interim targets (Table 11) are met during rehabilitation.

Rehabilitation of the impact site is scheduled to commence at year 6 of the project and will be carried out in accordance with the method described in the *Lot 5 Wellesley Road, Wellesley Rehabilitation Management and Monitoring Plan* (Appendix B of this report).

No plants will be translocated for rehabilitation; however, any mulch and topsoil will be respread to help establish a seed bed in the rehabilitation area. Rehabilitation will commence once extraction and stockpiling activities are complete.

7.1. Definition of a stable landform and self-sustaining pasture grass cover.

- Final land surface contoured to achieve a slope of no more than 1:3 vertical to horizontal.
- Quarry floor ripped to remove potential compaction and to establish low mounds that can facilitate stormwater penetration and create a seedbed.
- Stockpiled topsoil/overburden re-spread, with any produced mulch incorporated into the topsoil layer.
- Pasture grass seeds are sown into the rehabilitation areas prior to or during the wet winter season.
- Monitoring and maintenance of the rehabilitated area is carried out as per terms below.

7.2. Monitoring and Maintenance

Monitoring of rehabilitated areas will ensure that any areas requiring remedial work are identified. Monitoring will be carried out on an annual basis to assess:

- The physical stability of the landform in the rehabilitated areas.
- The success of the sown pasture grasses.
- The emergence of weeds.

Monitoring will continue until the completion criteria, presented below, have been fulfilled. Maintenance procedures will be carried out where necessary and may include:

- Repair of any erosion damage.
- Seeding areas that may not have regenerated.
- Weed control.

7.3. Roles and Responsibilities

Carbone Bros. will take full responsibility for the construction, operation, and rehabilitation for the project, including the monitoring, auditing and compliance with set conditions (with qualified

environmental consultants contracted to undertake the monitoring, surveys and reporting commitments).

7.4. Completion Criteria

Completion criteria must be sufficiently stringent to ensure that the overall objectives of the rehabilitation have been met. These criteria must also be designed to allow effective reporting and auditing to define an endpoint for the rehabilitation activities.

The completion criteria proposed for extractive operations on Lot 5 are presented in Table 11.

Table 11. Closure Criteria, Objectives, and Interim Targets

Criteria	Objective	Interim Targets
a) Safety	The site is safe to humans.	• Site is safe to humans during operations.
b) Sustainability	The site is sustainable in the long term without additional management inputs.	• Monitoring of the slope stability and grass cover to improve stability over time.
c) Suitability	The site is suitable for the agreed land uses.	• Monitoring of the slope stability and grass cover to improve stability over time
d) Visual amenity and heritage	The rehabilitated extraction area blends into the surrounding environment.	• Monitoring of the slope stability and grass cover to improve stability over time
e) Off-site impacts	Significant adverse off-site impacts are prevented.	• Significant adverse off-site impacts are prevented.
f) Hydrology	a. Site hydrology does not prevent the establishment of desired vegetation. b. Site hydrology does not reduce the stability of the landform. c. Stormwater is contained within the site.	• Stormwater is contained within the site during operations. • Identification and mitigation of any hydrology related issues during operations.
g) Soils and stability	a. Soil profiles and structures are sufficient to ensure vegetation establishment. b. The landform is stable.	• Topsoil is respread in all rehabilitation areas. • Identification and mitigation of potential erosion scars and scours during operations.
h) Vegetation	a. Pasture grasses cover the entire Stage 10 area after completion of the extraction phase.	• Annual inspections after pasture grass seeding to asses survival rates and grass condition. • After one-year pasture grasses cover 30% of target area increasing by 20% per annum

Criteria	Objective	Interim Targets
		thereafter which will equate to at least 80% cover after five years.
i) Weeds	a. Declared pest weeds are absent. b. The level of weed species should not be detrimental to the planted vegetation.	• Declared weed species removed systematically during operations. • Ground cover is no more than 20% weeds at any time throughout the project.

8. Risk Assessment

Factors to be considered when determining whether the proposal is likely to have a significant impact on matters of national environmental significance included sensitivity, value, and the quality of the environment, and upon the intensity, duration, magnitude and geographic extent of the impacts in accordance with the EPBC Significant Impact Guidelines 1.1 (DoE, 2013).

The expected effectiveness of proposed avoidance and mitigation measures have been assessed in terms of 'likelihood' and 'consequence' criteria to define the risk ranking according to Table 12. All residual risk ratings above a 'Low' ranking will be compensated for by offsets as discussed in Section 9 of this report.

Table 13 presents the risk assessment results, incorporating management objectives and measures to generate a residual risk outcome for each identified issue.

Table 12. Risk ranking matrix

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
Highly Likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

Table 13. Risk Assessment Results

Management Objective ***To reduce direct impacts to black cockatoo critical breeding, roosting or foraging habitat***		
Issue (Event or Circumstance)		
Clearing of 2.33ha of native vegetation which contains 27 potential black cockatoo breeding habitat trees will reduce the area of breeding habitat for black cockatoos.		
Proponent Management Commitment		
• The proponent has designed the project to achieve the least amount of disturbance and, where practicable, situated operations to avoid area of the highest conservation value (Banksia Woodland TEC to the north) whilst still being economically viable. • Areas required for roads, a gatehouse, site entry, stockpile areas and a vehicle turn around will be located in areas cleared for sand extraction or areas that are already cleared on Lot 5. • Environmental inductions will be given to site staff and contractors to ensure environmental obligations are understood. • Vegetation will be inspected for fauna prior to clearing to prevent injury or death to black cockatoos and other species that might reside amongst it.		
Likelihood	**Consequence**	**Risk Rating**
Likely	Moderate	Medium

Management Objective ***To reduce direct impacts to western ringtail possum habitat***
Issue (Event or Circumstance)
Clearing of 2.33ha of native vegetation will reduce the area of western ringtail possum habitat.
Proponent Management Commitment
• The proponent has designed the project to achieve the least amount of disturbance and, where

practicable, situated operations to avoid area of the highest conservation value and habitat actively used by western ringtail possum whilst still being economically viable.
- Areas required for roads, a gatehouse, site entry, stockpile areas and a vehicle turn around will be located in areas cleared for sand extraction or areas that are already cleared on Lot 5.
- Environmental inductions will be given to site staff and contractors to ensure environmental obligations are understood.
- Vegetation will be inspected for fauna prior to clearing to prevent injury or death to western ringtail possums and other species that might reside amongst it.

Likelihood	Consequence	Risk Rating
Likely	Moderate	Medium

Management Objective
To avoid unauthorised impacts to western ringtail possums and black cockatoo habitat.
Issue (Event or Circumstance)
Clearing more than the designated 2.33ha of native vegetation may lead to the loss of potential habitat for western ringtail possum and black cockatoos due to unauthorized clearing.
Proponent Management Commitment
All clearing areas will be marked with flagging and approved by the proponents site manager who will ensure clearing limits are located in accordance with relevant drawings and specifications prior to clearing commencing.

Likelihood	Consequence	Risk Rating
Rare	High	Low

Management Objective
To avoid injury or mortality to western ringtail possum or black cockatoos during vegetation clearing and operations.
Issue (Event or Circumstance)
Fauna mortality during clearing and excavation due to vehicle interaction with fauna or clearing of active breeding trees.
Proponent Management Commitment
• Inductions will be undertaken to ensure all contractors understand their environmental obligations. • Speed limits of 40km/hr will be applied throughout the proposed project area for safety purposes which will consequently reduce the risk of fauna strikes. • Trees will be inspected from ground-height, for signs of fauna prior to being felled. • A list of local wildlife rescue organisations and carers will be maintained on site to contact in the event of fauna injury • Clearing of the 2.33ha of vegetation will be programmed to occur between April and August to avoid the black cockatoo breeding season.

Likelihood	Consequence	Risk Rating
Unlikely	Moderate	Low

Management Objective
To avoid edge impacts into adjacent areas western ringtail possum and black cockatoo habitat.
Issue (Event or Circumstance)
Loss or degradation of habitat due to weed infestation
Proponent Management Commitment
Plant and Equipment will be inspected by the contractor prior to entry at the work site and be confirmed to be clean and free of vegetation and soil material. Unauthorised access to Lot 5 will be prevented through signage and exclusion fencing.

Weed spraying will be undertaken by a suitably qualified weed management contractor annually after the break of the season, over the following areas:

- The disturbance footprint including topsoil stockpiles
- A 50m buffer around the disturbance footprint,
- Spot spraying anywhere within Lot 5 where weed infestations have been noted.

The proponent will seek the assistance of qualified bushland weed contractors to ensure appropriate herbicide and rates are applied for the conditions of the plant community, the types of weeds and the severity of the infestation.

Likelihood	Consequence	Risk Rating
Unlikely	Moderate	Low

Management Objective (cont.)

To avoid edge impacts into adjacent areas western ringtail possum and black cockatoo habitat.

Issue (Event or Circumstance)

Disturbance to adjacent fauna populations and habitat due to operating noise

Proponent Management Commitment

Excavation and loading operations will be restricted to the hours of 0700 to 1800 Monday to Friday, and 0700 to 1200 Saturday. No work will be conducted on Sundays or public holidays. This minimises the impacts of operational noise on the surrounding habitat and fauna by minimising the hours of activity and noise and preventing noise at night time.

Likelihood	Consequence	Risk Rating
Likely	Minor	Low

Issue (Event or Circumstance)

Degradation of surrounding vegetation and habitat due to dust emissions from operations.

Proponent Management Commitment

- The proponent will implement their dust management plan to mitigate dust on site. This includes using water carts, as needed, to reduce dust generated during excavating or loading.
- Vehicle speeds will be limited to 50km/hr or under on site to reduce dust generated by vehicles in transit.
- Where conditions are deemed by the site supervisor to be too windy or likely to lead to high dust generation, dust-generating works will cease until the site supervisor deems it safe to continue.

Likelihood	Consequence	Risk Rating
Possible	Minor	Low

Issue (Event or Circumstance)

Degradation of surrounding vegetation and habitat due to a reduction in groundwater quality or availability.

Proponent Management Commitment

- No water abstraction is required for this project.
- Water required for dust suppression will be sourced from commercial outlets.
- The extraction will not intercept groundwater.
- The base of the pit will be at least 20 metres from the groundwater level (to 31mAHD, groundwater max. seasonal level 11m AHD).
- No fuel or lubricants will be stored on site (as per the EIL EMP in Appendix A).
- Refuelling will take place using a mobile refuelling vehicle which is equipped with a “snap-on snap-off, fast-fill and auto shut-off” facility.
- A fuel spill kit will be available on site always.
- The plant will be refuelled each morning, leaving the vehicles almost empty overnight.
- No major servicing, which could lead to fuel and oil spills, will take place on the site.
- The use of fertilisers during rehabilitation will be made in consultation with the DPIRD.
- Herbicides will be used only as required. In choosing herbicides, preference will be given to substances that strongly adsorb to soil and have low potential to leach into groundwater.

Likelihood	Consequence	Risk Rating

Unlikely	Moderate	Low
Management Objective (cont.) ***To avoid edge impacts into adjacent areas western ringtail possum and black cockatoo habitats.***		
Issue (Event or Circumstance)		
Loss and degradation of black cockatoo and western ringtail possum habitat through the introduction and spread of soil pathogens such as *Phytophthora* dieback.		
Proponent Management Commitment		
• Management will focus on enforcing stringent hygiene protocols for all plant and machinery before entering or leaving the site. • Plant and machinery will be inspected by the project site manager prior to entry and be confirmed to be clean and free of vegetation and soil material. • The proponent will keep vehicles and machinery to dedicated roads and out of remnant vegetation wherever possible. If vehicles must be taken into remnant vegetation, the vehicles will be cleaned first to remove potential fungal pathogens and weed seeds. • No surface water runoff from the working areas will be discharged to the surrounding unaltered landscape. Storm water runoff will be contained in the base of the pits. • Fencing around the boundary of the extraction area and property boundary will be maintained to curtail unauthorised access for the collection of firewood, four-wheel driving, horse-riding, and other activities that may have contribute to further degradation of the remnant vegetation.		
Likelihood	**Consequence**	**Risk Rating**
Unlikely	Moderate	Low
Issue (Event or Circumstance)		
Loss and degradation of western ringtail possum and black cockatoo habitat from altered fire regimes.		
Proponent Management Commitment		
• All vehicles, plant and equipment will be fitted with fire extinguishers and restricted to designated operations. • Fire danger ratings and Shire vehicle movement bans will be adhered to. • Fire breaks will be monitored and maintained in accordance with the *Bush Fires Act 1954*. • The proponent will cooperate with the Department of Biodiversity Conservation and Attractions (DBCA) in carrying out controlled burns if and when necessary.		
Likelihood	**Consequence**	**Risk Rating**
Rare	High	Low
Issue (Event or Circumstance)		
Loss and degradation of western ringtail possum and black cockatoo habitat and from landform alteration/erosion.		
Proponent Management Commitment		
• Surface water runoff from the extraction footprint will be contained within the base of the pit. No runoff will be discharged into the surrounding landscape. • Excavation of sand will be limited to 30m AHD. After extraction, the land surface will be recontoured with perimeter batters graded to a maximum of 1:3 (rise over run). • The footprint will be ripped after completion of extraction and rehabilitated to pasture, securing the soil insitu. • Rehabilitation will be monitored until established, to ensure any potential for erosion is managed.		
Likelihood	**Consequence**	**Risk Rating**
Unlikely	Minor	Low

9. Offset Proposal

Offsets are proposed as a measure to compensate for the residual impacts on MNES, due to the action, through the enduring protection and management of habitat. Protection will be achieved through a conservation covenant and will be listed on the certificate of title for the land.

9.1. Predicted or Potential Significant Residual Impacts

The proposed environmental offsets for significant residual impacts on MNES, that remain after avoidance and the implementation of mitigation measures, has been devised to comply with the EPBC Act Environmental Offsets Policy 2012 (DSEWPC, 2012) and achieve a high-quality environmental outcome.

The Offsets Assessment Guide (OAG), which utilises a balance-sheet approach to estimate impacts and offsets for threatened species and ecological communities has been utilised to determine appropriately sized offsets for the proposal.

Predicted or Potential significant residual impacts have been determined for:

- impacts to Western ringtail possum habitat (reduction in the total area of occupancy) from clearing 2.33ha of *Agonis flexuosa* habitat – **Medium**
- impacts to Carnaby's black cockatoo, Baudin's black cockatoo and the Forest Red-tailed black cockatoo habitat (reduction in the total area of occupancy) from clearing 2.33ha of native vegetation 27 potential black cockatoo breeding habitat trees – **Medium**

The proposal is not expected to result in significant indirect impacts to western ringtail possums or black cockatoos' species that may potentially occur within the area. The proposal will not fragment fauna habitat, with clearing being limited to a 2.33ha degraded remnant of *Agonis flexuosa* woodland amongst a much larger network of contiguous, more diverse vegetation.

9.2. The Proposed Offset Package

An area more than nine times the area of proposed clearing, that is less degraded, has intact mid and understoreys, and is of good to excellent quality Jarrah-Marri and Banksia Woodland of the Swan Coastal Plain, with a high density of Peppermint trees, will be covenanted, as an offset against the residual impacts of clearing 2.33ha of potential Western ringtail possum and black cockatoo species habitat and the clearing of 27 potential black cockatoo breeding habitat trees.

The offset is comprised of two blocks of remnant vegetation totalling 20.29 ha of land within Lot 5 Wellesley Road, being reserved as covenant for conservation purposes under the *National Trust of Australia Act 1964*. The land is dominated by Jarrah-Marri-Banksia woodland, with a high density of good to very good quality *Agonis flexuosa* WRP habitat throughout. The offsets appear to support western ringtail possum and black cockatoo species, with evidence of both actively utilising the areas, with scats and signs of foraging noted during field surveys (shown on Figure 2).

9.3. Conservation Objectives

The offset proposal satisfies the principles of the EPBC Act 1999 Environmental Offsets Policy (DSEWPC, 2012). The Environmental Offsets Policy requires that offsets for significant residual

impacts must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.

The State recovery plan for Western Ringtail Possum includes actions to improve WRP habitat connectivity and to implement hygiene protocols to prevent disease and pathogen spread (such as Myrtle rust, *Phytophthora* sp.). The creation of the covenant promotes these actions as offset area 1 is 250m west of an existing 13.5ha covenant on the property as well as connected to large tracts of the remnant vegetation surrounding the property including vegetation buffering the neighbouring power station and a conservation reserve on the property to the south of offset area (335 Wellesley Road). The offsets will be fenced to prevent vehicle and pedestrian access thereby reducing potential for disease transmission into the area and preventing damage to understorey from firewood, four-wheel driving, and animal grazing activity.

The State Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan (DEC, 2008) and the State Carnaby Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (DPAW, 2013) both include objectives to protect habitat critical to the black cockatoo species survival. This offset package will see 20.29 ha of important habitat protected. The vegetation in the offsets offer more than 72 identified habitat trees made up as follows:

- 40 trees with DBH ≥ 50cm and one or more large hollows suitable for black cockatoo breeding
- 32 trees with DBH ≥ 50cm and small or no hollows

surrounded by good to excellent quality foraging habitat, in the form of a variety of mature banksia species and large Jarrah trees. Controlling grazing of understorey and soil compaction is also recognised as important to their recovery. As the covenant will be fenced, stock will not be able to trespass into the area preventing further degradation of habitat from grazing or hooves compacting the soil.

This offset proposal also satisfies the Western Australian government's offset policy requirements and provides full offset for the cumulative, residual impacts of the proposed clearing and extraction operations.

9.4. Establishing Offsets through Conservation Covenant

Direct offsets will involve a statutory covenant being agreed between the land owner and the National Trust WA under s21A of the *National Trust of Australia Act 1964*. The covenant will be binding upon the current and all future owners of the land.

The covenant will be registered as a restricted covenant for conservation of bushland, over the offset area on the Certificate of Title. The owner continues to own the land and will agree to manage the covenanted vegetation in such a way as to preserve and maintain its ecological values. The proponent will achieve this through fencing the land and abiding by all National Trust of WA covenant limitations, conditions and restrictions.

9.5. Covenant restrictions and conditions

Proposed covenant restrictions will include:

- Subdivision or construction of buildings
- Removal or clearing of native vegetation
- Mining

- Erecting transmission lines
- Rubbish storage

Exemptions may include:

- Seed collection
- Passive scientific study
- Fire mitigation activity

The title holder remains responsible for ongoing maintenance and funding to preserve the conservation covenant.

The proponent expects that the regulatory instruments that will enforce positive management of the offset area will be the DWER Clearing Permit (CPS 8561/1), the DWER Licence for a Prescribed Premises, the DCCEEW 2021-9034 EPBC Act approval, and the Shire of Harvey Development Approval and Extractive Industry Licence and that required by the NTWA. The proponent will be responsible for resourcing all positive management activities for the initial establishment of the covenant, required by these instruments, according to the duration set out in the approval conditions.

The proponent is committed to establishing the covenants by following the process:

- Obtain agreement in principle from the National Trust WA under s21A of the *National Trust of Australia Act 1964*.
- Engage a licensed surveyor to draw up an Interests Only Deposited Plan (IODP) for the Certificate of Title. (The surveyor will then lodge the IODP with Landgate.)
- Pay any reasonable fee that the National Trust of WA charges.
- Review and sign the documents including a statement of undertaking that confirms that the conservation covenant perpetual duration.
- Lodge signed document with Landgate for registration of the memorial on the Certificate of Title.

9.6. Offset Area Attributes

The proposed offset contains a variety of priority ecological values and preservation of these will benefit the local populations of western ringtail possum and black cockatoos. The vegetation within the offset Area 1 was surveyed in part in 2019 and in 2020 (Appendix F and G). The vegetation within offset Area 2 was surveyed in October and November 2020 (Appendix G). The offset Areas are comprised of *Eucalyptus marginata - Banksia attenuate* woodland with varying densities of *Agonis flexuosa* over *Banksia grandis* and a shrubland of *Xanthorrhoea gracilis* and *Hibbertia hypericoides* and a herbland of *Dasypogon bromeliifolius, Anarthria prolifera* and *Desmocladus fasciculatus* on grey sands. The vegetation here is rated as 'Good' or better with much of the original vertical structure intact as well as the original shrub and tree density.

Offset Area 1 was surveyed for its habitat value, partly in 2018 and in 2020 (Appendix E and G). The Offset Area 2 was surveyed for its habitat value in 2020 (Appendix G). The vegetation type demonstrates key diagnostic characteristics for the Commonwealth-listed TEC '*Banksia* dominated woodlands of the Swan Coastal Plain IBRA Region' which is known to provide good cockatoo breeding and foraging habitat. This TEC is an important community for providing foraging habitat for black cockatoos and many other native fauna. Offset Areas 1 and 2 contain a total of 72 habitat trees (>50cm DBH) of which 17 have no hollows, 15 have small hollows and 40 with hollows large enough to support black cockatoos. It is thus a favourable location for cockatoo breeding as well.

The intact understorey and presence of healthy, in some places high density *Agonis flexuosa*, provides excellent Western Ringtail Possum (WRP) habitat. The fauna surveys (Appendices E and G) of the offset areas did identify potential WRP activity already in the area. With fencing and prevention of stock and vehicle access to the area, it is likely this possum activity will increase over time.

The proposed offset meets the overall definition of 'like-for-like' principles based on the species composition, maturity of trees, vegetation structure and other habitat and landscape features of the proposed project area. The offset areas provide linkage between an existing conservation covenant and remnant vegetation extensive DBCA managed lands to the north and east. It also connects to the southwest regional ecological linkages. The majority of the vegetation in Offset area 1 is rated 'very good' condition with the western-most section recorded as being in 'excellent' condition according to the Keighery Vegetation Condition Scale (Plantecology, 2020). Most of the vegetation structure in Offset Area 2 is intact and as such has been assigned a condition rating of 'Very good' or 'Excellent'.

Section 9.8 below outlines the inputs and justifications used to calculate the offset required for the cumulative residual impacts of the proposed clearing. Figure 2 shows the location and extents of the surveys relied upon to determine the inputs for the Offset Assessment Guide (OAG) calculator."

9.7. Offset assessment guide calculations.

The Offset Assessment Guide balance-sheet was used in calculating the value of the selected offset area to the proposed project area impacts. The parameters used for the offset calculations have been determined for each MNES through an assessment of regional and local databases and mapping, aerial photography and project specific fauna and flora surveys. The offset area calculated for each MNES is presented in Table 14. A summary of the OAG inputs and justifications and final percentage of offset for each MNES is given in Table 15, 16, 17 and 18.

The criteria used in the offset calculator adopts the DCCEEW descriptions of habitat quality with consideration of the suitability of the habitat to support the protected matter of interest, as follows:

0- Completely degraded
1- Completely degraded to degraded
2- Degraded
3- Degraded to good
4- Good
5- Good to very good
6- Very good
7- Very good to excellent
8- Excellent
9- Excellent to pristine
10- Pristine

Table 14. Calculated outputs for each MNES

MNES	Impact Area	% of impact offset	Offset Area
Western Ringtail Possum Habitat	2.33ha @ quality 3 = 0.70ha (adjusted)	148.2%	20.29 ha
Carnaby's Black cockatoo breeding habitat	2.33ha @ quality 3 = 0.70ha (adjusted)	101.58%	20.29 ha
Forest red-tailed black cockatoo foraging habitat	2.33ha @ quality 3 = 0.70ha (adjusted)	112.19%	20.29 ha
Baudin's black cockatoo	2.33ha @ quality 3 = 0.70ha (adjusted)	101.58%	20.29 ha

9.8. OAG Inputs and Justifications

Table 15. OAG Calculations for Western Ringtail Possum (Critically Endangered)

Description of Input/ Attribute	Value	Rational
IUCN Criteria	6.80%	Western Ringtail Possum habitat as the species is listed as Critically Endangered under the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999.*
Area of impact (habitat/community) or Quantum of impact (features/individuals)	2.33ha	Comprises the portion of the application area that provides habitat for the Western Ringtail Possum.
Quality of impacted area (habitat/community)	3	Contains Western Ringtail Possum habitat (i.e., *Agonis flexuosa*), however, no evidence of the species utilising the site was found (no dreys, scats or individuals). Unlikely to be present or if present they are likely in low densities (Harewood 2022). Vegetation comprised of Degraded (Keighery 1994) *Agonis flexuosa* with occasional mature eucalypts over sparse to little understorey. Applying the observations from the flora and fauna surveys against the Habitat Quality Assessment (30% site quality, 30% site context and 40% species stocking rate) a **habitat quality score of 3** is given for this vegetation in relation to WRP habitat: • **Site Quality -** 10% - absent understorey, though does contain mature peppermint trees. • **Site Context** - 15% - the site is not part of the core habitat or primary corridors for WRP, but does occur nearby higher quality native vegetation that has WRP utilising it • **Species Stocking Rate** - 5% - there is no evidence of WRP activity or use within the clearing area including night survey (Harewood, 2020 & Harewood, 2022).
Time over which loss is averted (habitat/community)	20	The offset site will be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	10	The process of fencing and managing the offset as per the Offset Management Plan (OMP) will proceed within the first year of the proposal commencing. However the benefit of these management actions to improve the quality of Western Ringtail Possum habitat within the offset is unlikely to be realised for

		several years (allowing for WRP population to be more successful with less predation). To reflect this, it is estimated that it will take 10 years for the full value and benefit of the offset management actions to be realised.
Start area (habitat/community) or Start value (features/individuals)	20.29 ha	Total area of Offset Package
Start quality (habitat/community)	6	The vegetation in Offset Area 1 is in Good to Very Good (Keighery 1994) (Plantecology, 2020) or and Very Good to Excellent in Offset Area 2 (LEC, 2020) and incorporates a midstory of *Agonis flexuosa* over dense understorey, offering excellent cover and foraging habitat for WRP. WRP scats were recorded within both offset areas, indicating the species actively frequent the areas (LEC, 2020). The offset site is connected on three sides to similar remnant native vegetation, supporting connectivity for fauna movement, highlighted as a recovery goal in the
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	5	The value the vegetation provides towards supporting WRP is likely to degrade over the next 10 years if not actively managed, due to a number of pressures. With sand extraction and rehabilitation being completed over the existing pits on the property, this land will be handed back to the landowner and returned to pastoral grazing. With stock being re-introduced to the property, it is reasonable to expect, without fencing stock will roam into the proposed offset area. Livestock grazing is associated with a decline in native perennial cover and an increase in exotic annual cover (weeds establishment), reduced litter cover, reduced soil cryptogam cover, loss of surface soil microtopography, increased erosion, changes in the concentrations of soil nutrients, degradation of surface soil structure, reduced soil water infiltration rates and changes in near ground and soil microclimate. (Yates et al, 2000) Grazing pressure can dramatically reduce the understorey cover, which in turn can increase fox predation (Shedley & Williams, 2014) and discourage Western Ringtail Possum to utilise the area, reducing the vegetation habitat quality over time. Further to this the site is already subject to fox predation, with the species being observed during the fauna survey (Harewood, 2020). Fox and cat predation is a known threat to the WRP, with the possums being most at risk when they need to come to the ground due to lack of canopy connectivity (DPAW, 2017).

		Without management predation by feral species is likely to further degrade the value of the vegetation to WRP.
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	7	The proposed offset will be fenced and management measures will be applied annually as per the Offset Management Plan (Appendix K) to ensure fox and cat predation is controlled. The lack of other human activity, fencing to prevent stock access, dead trees and fallen timber being left insitu and weeds being managed where they are impacting habitat, is likely to lead to an increase in undergrowth density and ability for safe passage for WRP, increasing their WRP activity in the offset areas. Forest areas where fox control efforts have been substantial support higher densities of WRP (Wayne et al. 2006). Forest with limited anthropogenic disturbance, fox control and connectivity are considered habitat critical to WRP survival (DPAW, 2017). It is expected that the Western Ringtail Possum habitat quality would increase, over time as a result of these management actions.
Risk of loss (%) without offset (habitat/community)	0.00%	It is known that the offset site most likely contains valuable sand resource, however as it also contains MNES, any development of this land would require offsetting, therefore a risk of loss of 0 has been applied (as per Figure 4 pathway A in the Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act)
Risk of loss (%) with offset (habitat/community)	0%	With offset, the risk of the habitat within these areas being completely lost is reduced as the areas will be fenced and managed to minimise external pressures on the vegetation.
Confidence in result (%) – risk of loss (habitat/community)	100%	There is a high level of confidence the offset site will not be lost due to the restrictive conservation covenant as this will be maintained into the future.
Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)	50%	There is a medium level of confidence that the offset site will decline in value if not secured with a covenant and fenced as the impacts described above such as grazing and feral animals, will be unmanaged, allowing further degradation of the site. With offset the vegetation will be covenanted under National Trust of WA and this will include restricting access via fencing and feral animal control annually, leading to preservation of habitat quality.
% of impact offset	148.20%	Obtained through the input of variables explained above.

Table 16. OAG Calculations for Carnaby's black cockatoos (Endangered)

Description of Input/ Attribute	Value	Rational
IUCN Criteria	1.20%	Carnaby's cockatoo habitat as this species is listed as Endangered under the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999.*
Area of impact (habitat/ community) or Quantum of impact (features/ individuals)	2.33ha	Comprises the portion of the application area that provides low quality foraging habitat for Carnaby's cockatoo.
Quality of impacted area (habitat/ community)	3	The quality of Carnaby's cockatoo breeding habitat within the proposed clearing area is poor given the general absence of marri and banksia and the dominance of peppermint, with only seven habitat trees offering large enough hollows suitable for breeding and no evidence of black cockatoo activity such as chew marks, foraging or roosting observed (Harewood, 2022). Applying the observations from the flora and fauna surveys against the Habitat Quality Assessment (30% site quality, 30% site context and 40% species stocking rate) a habitat quality score of 3 is given for this vegetation in relation to black cockatoos based on: • **Site Quality** - 10% - no foraging available within the area, except the occasional marri tree and no evidence of the habitat trees that do contain large hollows being utilised. • **Site Context** - 10% - the site does occur nearby higher quality native vegetation that has black cockatoos utilising it, however the site is not required to connect the good-excellent quality vegetation surrounding it. • **Species Stocking Rate** - 5% - there is no evidence of black cockatoo activity or use of the vegetation within the clearing area (Harewood, 2020 & Harewood, 2022).
Time over which loss is averted (habitat /community)	20	The offset site would be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/ community) or Time horizon (features/ individuals)	10	The process of fencing, excluding disturbing activities such as driving, stock wandering, and fire wood collection, minimising fire impact and controlling feral animals as per the Offset Management Plan, will proceed within the first year of the proposal commencing.

		However, the benefit of these management actions to improve the quality of Black Cockatoo habitat within the offset is unlikely to be realised for several years, as they breed and utilise the primary habitat trees and surrounding foraging vegetation. To reflect this, it is estimated that it will take 10 years for the full value and benefit of the offset management actions to be realised.
Start area (habitat/ community) or Start value (features/ individuals)	20.29 ha	Total area of offset package
Start quality (habitat/community)	7	The vegetation is in 'Good' to 'Excellent' condition and incorporates an overstorey of Eucalypts, with more than 40 habitat trees with large hollows recorded, providing excellent nesting habitat as well as a dense foraging resource of *Eucalyptus marginata over Banksia attenuata* (LEC, 2020). The proposed offset is connected to a vast block of continuous native vegetation to the east and south and is in close proximity to an existing covenant to the west, which was observed to have an abundance of recent black cockatoo foraging (LEC,2021). These are all recognised as important values for the three black cockatoo species, therefore the vegetation is considered to be a habitat quality of 7 for the species.
Future quality without offset (habitat/ community) or Future value without offset (features/ individuals)	6	The survey of the offset area did find there were some patches of poorer quality understorey within some parts of the offset. It was concluded that these patches are most likely due to past grazing, firewood collection and historic logging. It is reasonable to expect that the quality of this bushland will reduce over time due to continued access and human activity over the area. With pastoral activities being reintroduced to the completed extraction areas immediately south east of the offset, the area will also be subject to more grazing pressure. Unmanaged, this will likely lead to further declines over time in the value and quality of the habitat here for cockatoos.
Future quality with offset (habitat/ community) or Future value with offset (features/ individuals)	7	t is assumed that the Carnaby's cockatoo habitat quality would as a minimum remain the same over time with the prevention of access and disturbance.
Risk of loss (%) without offset (habitat/ community)	0.00%	It is known that the offset site most likely contains valuable sand resource, however as it also contains MNES, any development of this land would require offsetting, therefore a risk of loss of 0 has been applied (as per Figure 4 pathway A in the Guidance for deriving 'Risk of Loss' estimates when evaluating

		biodiversity offset proposals under the EPBC Act)
Risk of loss (%) with offset (habitat/community)	0%	With offset, the risk of the habitat within these areas being completely lost is reduced as the areas will be fenced and managed to minimise external pressures on the vegetation and cockatoo species.
Confidence in result (%) – risk of loss (habitat/ community)	100%	There is a high level of confidence that securing the offset in restrictive conservation estate in perpetuity would mitigate the risk of loss.
Confidence in result (%) – Change in quality (habitat/ community) or Change in value (features/ individuals)	40%	With offset the vegetation will be covenanted under National Trust of WA and this will include restricting access and managing the offset with feral species control to preserve its habitat values. There is a medium level of certainty that this will result in an equal or greater impact to the habitat quality for black cockatoos.
% of impact offset	101.58%	Obtained through the input of variables explained above.

Table 17. OAG Calculations for Baudin's black cockatoos (Endangered)

Description of Input/ Attribute	Value	Rational
IUCN Criteria	1.20%	Baudin's Cockatoo habitat as this species is listed as Endangered under the Wildlife Conservation Act 1950 and the Environment Protection and Biodiversity Conservation Act 1999.
Area of impact (habitat/ community) or Quantum of impact (features/ individuals)	2.33ha	Comprises the portion of the application area that provides low quality foraging habitat for Baudin's Cockatoo.
Quality of impacted area (habitat/ community)	3	The quality of Baudin's Cockatoo breeding habitat within the proposed clearing area is poor given the general absence of marri and banksia and the dominance of peppermint, with only seven habitat trees offering large enough hollows suitable for breeding and no evidence of black cockatoo activity such as chew marks, foraging or roosting observed (Harewood, 2022). Applying the observations from the flora and fauna surveys against the Habitat Quality Assessment (30% site quality, 30% site context and 40% species stocking rate) a habitat quality score of 3 is given for this vegetation in relation to black cockatoos based on: • **Site Quality** - 10% - no foraging available within the area, except the occasional marri tree and no evidence of the habitat trees that do contain large hollows being utilised. • **Site Context** - 10% - the site does occur nearby higher quality native vegetation that has black cockatoos utilising it, however the site is not required to connect the good-excellent quality vegetation surrounding it. • **Species Stocking Rate** - 5% - there is no evidence of black cockatoo activity or use of the vegetation within the clearing area (Harewood, 2020 & Harewood, 2022).
Time over which loss is averted (habitat /community)	20	The offset site would be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/ community) or Time horizon (features/ individuals)	10	The process of fencing, excluding disturbing activities such as driving, stock wandering, and fire wood collection, minimising fire impact and controlling feral animals as per the Offset Management Plan, will proceed within the first year of the proposal commencing.

		However, the benefit of these management actions to improve the quality of Black Cockatoo habitat within the offset is unlikely to be realised for several years, as they breed and utilise the primary habitat trees and surrounding foraging vegetation. To reflect this, it is estimated that it will take 10 years for the full value and benefit of the offset management actions to be realised.
Start area (habitat/ community) or Start value (features/ individuals)	20.29 ha	Total area of offset package
Start quality (habitat/community)	7	The vegetation is in 'Good' to 'Excellent' condition and incorporates an overstorey of Eucalypts, with more than 40 habitat trees with large hollows recorded, providing excellent nesting habitat as well as a dense foraging resource of *Eucalyptus marginata over Banksia attenuata* (LEC, 2020). The proposed offset is connected to a vast block of continuous native vegetation to the east and south and is in close proximity to an existing covenant to the west, which was observed to have an abundance of recent black cockatoo foraging (LEC,2021). These are all recognised as important values for the three black cockatoo species, therefore the vegetation is considered to be a habitat quality of 7 for the species.
Future quality without offset (habitat/ community) or Future value without offset (features/ individuals)	6	The survey of the offset area did find there were some patches of poorer quality understorey within some parts of the offset. It was concluded that these patches are most likely due to past grazing, firewood collection and historic logging. It is reasonable to expect that the quality of this bushland will reduce over time due to continued access and human activity over the area. With pastoral activities being reintroduced to the completed extraction areas immediately south east of the offset, the area will also be subject to more grazing pressure. Unmanaged, this will likely lead to further declines over time in the value and quality of the habitat here for cockatoos.
Future quality with offset (habitat/ community) or Future value with offset (features/ individuals)	7	It is assumed that the Baudin's Cockatoo habitat quality would as a minimum remain the same over time with the prevention of access and disturbance.
Risk of loss (%) without offset (habitat/ community)	0.00%	It is known that the offset site most likely contains valuable sand resource, however as it also contains MNES, any development of this land would require offsetting, therefore a risk of loss of 0 has been applied (as per Figure 4 pathway A in the Guidance for deriving 'Risk of Loss' estimates when evaluating

		biodiversity offset proposals under the EPBC Act)
Risk of loss (%) with offset (habitat/community)	0%	With offset, the risk of the habitat within these areas being completely lost is reduced as the areas will be fenced and managed to minimise external pressures on the vegetation and cockatoo species.
Confidence in result (%) – risk of loss (habitat/ community)	100%	There is a high level of confidence that securing the offset in restrictive conservation estate in perpetuity would mitigate the risk of loss.
Confidence in result (%) – Change in quality (habitat/ community) or Change in value (features/ individuals)	40%	With offset the vegetation will be covenanted under National Trust of WA and this will include restricting access and managing the offset with feral species control to preserve its habitat values. There is a medium level of certainty that this will result in an equal or greater impact to the habitat quality for black cockatoos.
% of impact offset	101.58%	Obtained through the input of variables explained above.

Table 18. OAG Calculations for the Forest red-tailed black cockatoo (Vulnerable).

Description of Input/ Attribute	Value	Rational
IUCN Criteria	0,20 %	Forest Red-tailed Black Cockatoo habitat as this species is listed as Vulnerable under the Environment Protection and Biodiversity Conservation Act 1999.
Area of impact (habitat/ community) or Quantum of impact (features/ individuals)	2.33ha	Comprises the portion of the application area that provides low quality foraging habitat for the Forest Red-tailed Black Cockatoo.
Quality of impacted area (habitat/ community)	3	The quality of Forest Red-tailed Black Cockatoo breeding habitat within the proposed clearing area is poor given the general absence of marri and banksia and the dominance of peppermint, with only seven habitat trees offering large enough hollows suitable for breeding and no evidence of black cockatoo activity such as chew marks, foraging or roosting observed (Harewood, 2022). Applying the observations from the flora and fauna surveys against the Habitat Quality Assessment (30% site quality, 30% site context and 40% species stocking rate) a habitat quality score of 3 is given for this vegetation in relation to black cockatoos based on: • **Site Quality** - 10% - no foraging available within the area, except the occasional marri tree and no evidence of the habitat trees that do contain large hollows being utilised. • **Site Context** - 10% - the site does occur nearby higher quality native vegetation that has black cockatoos utilising it, however the site is not required to connect the good-excellent quality vegetation surrounding it. • **Species Stocking Rate** - 5% - there is no evidence of black cockatoo activity or use of the vegetation within the clearing area (Harewood, 2020 & Harewood, 2022).
Time over which loss is averted (habitat /community)	20	The offset site would be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/ community) or Time horizon (features/ individuals)	10	The process of fencing, excluding disturbing activities such as driving, stock wandering, and fire wood collection, minimising fire impact and controlling feral animals as per the Offset Management Plan, will proceed within the first year of the proposal commencing. However, the benefit of these management actions to improve the quality of

		Forest Red-tailed Black Cockatoo habitat within the offset is unlikely to be realised for several years, as they breed and utilise the primary habitat trees and surrounding foraging vegetation. To reflect this, it is estimated that it will take 10 years for the full value and benefit of the offset management actions to be realised.
Start area (habitat/ community) or Start value (features/ individuals)	20.29 ha	Total area of offset package
Start quality (habitat/community)	7	The vegetation is in 'Good' to 'Excellent' condition and incorporates an overstorey of Eucalypts, with more than 40 habitat trees with large hollows recorded, providing excellent nesting habitat as well as a dense foraging resource of *Eucalyptus marginata over Banksia attenuata* (LEC, 2020). The proposed offset is connected to a vast block of continuous native vegetation to the east and south and is in close proximity to an existing covenant to the west, which was observed to have an abundance of recent black cockatoo foraging (LEC,2021). These are all recognised as important values for the three black cockatoo species, therefore the vegetation is considered to be a habitat quality of 7 for the species.
Future quality without offset (habitat/ community) or Future value without offset (features/ individuals)	6	The survey of the offset area did find there were some patches of poorer quality understorey within some parts of the offset. It was concluded that these patches are most likely due to past grazing, firewood collection and historic logging. It is reasonable to expect that the quality of this bushland will reduce over time due to continued access and human activity over the area. With pastoral activities being reintroduced to the completed extraction areas immediately south east of the offset, the area will also be subject to more grazing pressure. Unmanaged, this will likely lead to further declines over time in the value and quality of the habitat here for cockatoos.
Future quality with offset (habitat/ community) or Future value with offset (features/ individuals)	7	It is assumed that the Forest Red-tailed Black Cockatoo habitat quality would as a minimum remain the same over time with the prevention of access and disturbance.
Risk of loss (%) without offset (habitat/ community)	0.00%	It is known that the offset site most likely contains valuable sand resource, however as it also contains MNES, any development of this land would require offsetting, therefore a risk of loss of 0 has been applied (as per Figure 4 pathway

		A in the Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act)
Risk of loss (%) with offset (habitat/community)	0%	With offset, the risk of the habitat within these areas being completely lost is reduced as the areas will be fenced and managed to minimise external pressures on the vegetation and cockatoo species.
Confidence in result (%) – risk of loss (habitat/ community)	100%	There is a high level of confidence that securing the offset in restrictive conservation estate in perpetuity would mitigate the risk of loss.
Confidence in result (%) – Change in quality (habitat/ community) or Change in value (features/ individuals)	40%	With offset the vegetation will be covenanted under National Trust of WA and this will include restricting access and managing the offset with feral species control to preserve its habitat values. There is a medium level of certainty that this will result in an equal or greater impact to the habitat quality for black cockatoos.
% of impact offset	112.19%	Obtained through the input of variables explained above.

9.9. Offset requirements.

Offsets have been proposed as a measure to compensate for the residual impacts on MNES of the proposed action. The EPBC Act Environmental Offsets Policy (DSEWPC, 2012) lists the eight requirements for offsets, which this proposal has met as follows:

1. Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter

The offset proposed has been tailored specifically to the MNES that is impacted, and overall delivers a conservation gain. Section 9.3describes the offset areas attributes and how these relate to the MNES.

Protection will be achieved through conservation covenant, with the result of enduring preservation and management of habitat. The proposed offset ensures for each MNES a *total percentage of impact offset* of 100% or more, reflecting that the proposed offset compensates for more than the total quantum of impact, and hence delivers a conservation gain.

2. Suitable offsets must be built around direct offsets but may include other compensatory measures

The proposed offset 100% directly offsets each of the MNES impacted.

3. Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter

The offsets proposed have taken into consideration the conservation status of the MNES impacted by the proposed action, which are detailed in Section 4 of this report, and taken into consideration in the Offsets Assessment Guide (OAG) calculations.

The OAG calculator has automatically calculated the annual probability of extinction of each impacted MNES based on their conservation status as listed under the EPBC Act. This figure, derived from the International Union for the Conservation of Nature (IUCN) Red List for threatened species, has been incorporated into the impact and offset calculation process.

The above has resulted in the offset being in proportion to the level of statutory protection of the MNES impacted, with an area more than nine times the area of proposed clearing proposed for covenant.

4. Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter

The OAG, which utilises a balance-sheet approach to estimate impacts and offsets for threatened species and ecological communities has been utilised to determine appropriately sized offsets for the proposal.

Residual impacts on the MNES have been determined as follows:

- Direct impacts to Western ringtail possum habitat from clearing 2.33ha of native vegetation – **Medium**
- Direct impacts to Carnaby's black cockatoo, Baudin's black cockatoo, the forest red-tailed black cockatoo and 27 potential black cockatoo breeding habitat trees (reduction in the total area of occupancy) from clearing 2.33ha of native vegetation – **Medium**
- Direct impacts to EPBC Act listed orchid (*Caladenia procera, Diuris drummondii, Diuris micrantha, Drakaea elastica* and *Drakaea micrantha*) habitat, including habitat for associated mycorrhizal fungus and the pollinating wasp species from clearing 2.33ha of native vegetation – **Low**.

Factors considered when determining the residual impact on the MNES included sensitivity, value, and the quality of the environment, conservation status, and upon the intensity, duration, magnitude and geographic extent of the impacts.
The OAG calculations have also taken into account the level of threat (risk of loss) that a proposed offset site is under, the time it will take an offset to yield a conservation gain for the MNES, and the risk of the conservation gain not being realized (percentage of confidence in result).

The proposed offset has OAG percentages of impact higher than 100% (see Table 15, 16, 17 and 18) reflecting that the proposed offsets compensate for more than the total quantum of impact, and hence are of a size and scale proportionate to (or greater than) the residual impacts on the MNES.

5. Suitable offsets must effectively account for and manage the risks of the offset not succeeding

The offsets proposed are all 100% direct offsets, which present a lower risk of not succeeding compared to other compensatory measures. Protection will be achieved through conservation covenant, with the result of enduring protection and management of habitat, as detailed in section 9.4 & 9.5 of this report. Statutory covenants are binding not just upon the current owner Lyndon Edwards, but all future owners of the land, and can be put in place immediately, resulting in immediate conservation gain and associated reduction in risk.

The OAG calculations have taken into account the risk of the conservation gain of the offset not succeeding within the confidence in results input (as a percentage). All offset proposal calculations have a high confidence in results (generally 85%), reflecting the high level of certainty of successful achievement of the outcome due to the strength of the restrictive covenant proposed, the presence of other formal protective mechanisms in place (i.e. Regulatory Approval Instruments) and the achievable and measurable outcomes within the *Lot 5 Wellesley Offset Management Plan* and *Lot 5 Wellesley Road Rehabilitation Management and Monitoring Plan*.

6. Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs

The offset proposed is additional to existing requirements, schemes or legal determinations. There are no requirements for Carbone Bros Pty Ltd to register the conservation covenant proposed.
The proposed offset area does not have any existing formal conservation arrangement in place or existing requirements from other approvals that requires the landowner to undertake conservation works.
Carbone Bros Pty Ltd is providing to DWER the same offset area and rehabilitation plan as per this EPBC offsets proposal under the clearing permit application CPS 8561/1. As the offsets are for the same action, both state and EPBC Act offsets have been aligned to compensate for the residual impact to the MNES. As per the EPBC Act Environmental Offsets Policy (DSEWPC, 2012) a state offset will count towards an offset under the EPBC Act if it compensates for residual impact to the MNES. The offsets proposed have been tailored specifically to the MNES that are impacted and are in proportion to the level of statutory protection as listed under the EPBC Act.

7. Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable

The offset proposed will result in conservation gains to the MNES and is effective in offsetting the proposed actions, as demonstrated in the OAG calculations, where the proposed offsets compensate for more than the total quantum of impact (Table 15, 16, 17 and 18). All aspects of the offset proposal have been described thoroughly in this report for transparency, including the evaluation of environmental values and all calculations.

Wherever possible, scientific literature has been consulted throughout this proposal to help develop appropriate offsets, with references clearly stated within the text and listed in the references section. This has included site specific surveys arranged by Carbone Bros Pty Ltd to gather site specific data (included in the appendices), as well as reviewing relevant regional studies.
The offset proposed is timely, as the conservation covenant process can be implemented immediately, resulting in immediate conservation gain. Environmental management measures will be put in place over the first five years and rehabilitation of the extraction footprint will occur once operational activity is complete.

8. Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced

Monitoring and reporting on the proponents' operations will be a condition of approval under numerous regulatory instruments, as listed in Table 19. Compliance and enforcement for this site will be conducted by the following regulators: DWER Native Vegetation Compliance Branch, DWER Industry Regulation Compliance Branch, DCCEEW Compliance and Enforcement Branch, and the Shire of Harvey.

Table 19. Reporting Requirements

Regulatory Instrument	Report Title	Report Timing	Description of standard	Reported to
DWER CPS 8561/1 Clearing Permit	Part V Division 2 of EP Act - Monitoring Report	Annually	Compliance with Clearing Permit Conditions	Native Vegetation Branch
DWER Licence for a Prescribed Premises	Part V Division 3 of EP Act – Monitoring Report	Annually	Compliance with Licence Conditions	Industry Regulation Compliance Branch
DCCEEW EPBC Act Approval (once approved)	EPBC Act Compliance Report	Annually	Compliance with EIL EMP, Rehabilitation Management and Monitoring Plan and Permit Conditions	Compliance and Enforcement Branch
Shire DA & EIL (Planning and Development Act 2005, EIL Local Law 2017)	Shire Compliance Report	Annually	Compliance with EIL EMP and licence conditions	Shire of Harvey Planning Department

As well as the above compliance reporting, the National Trust of WA will undertake Stewardship visits to assess the management activities and general condition of the covenant and review relevant records.

9.10. Offset Management Plan

The offset will be managed as per the Offset Management Plan provided in Appendix K. This plan outlines the management actions and responsibilities of both the proponent and landowner in the creation, protection, management and monitoring of the proposed conservation covenant offsets.

The condition of the offset areas will be considered as part of the annual EPBC compliance inspection and if required the offset management plan will be reviewed and amended to ensure the actions are adequate to preserve and maintain the habitat values provided by the offsets.

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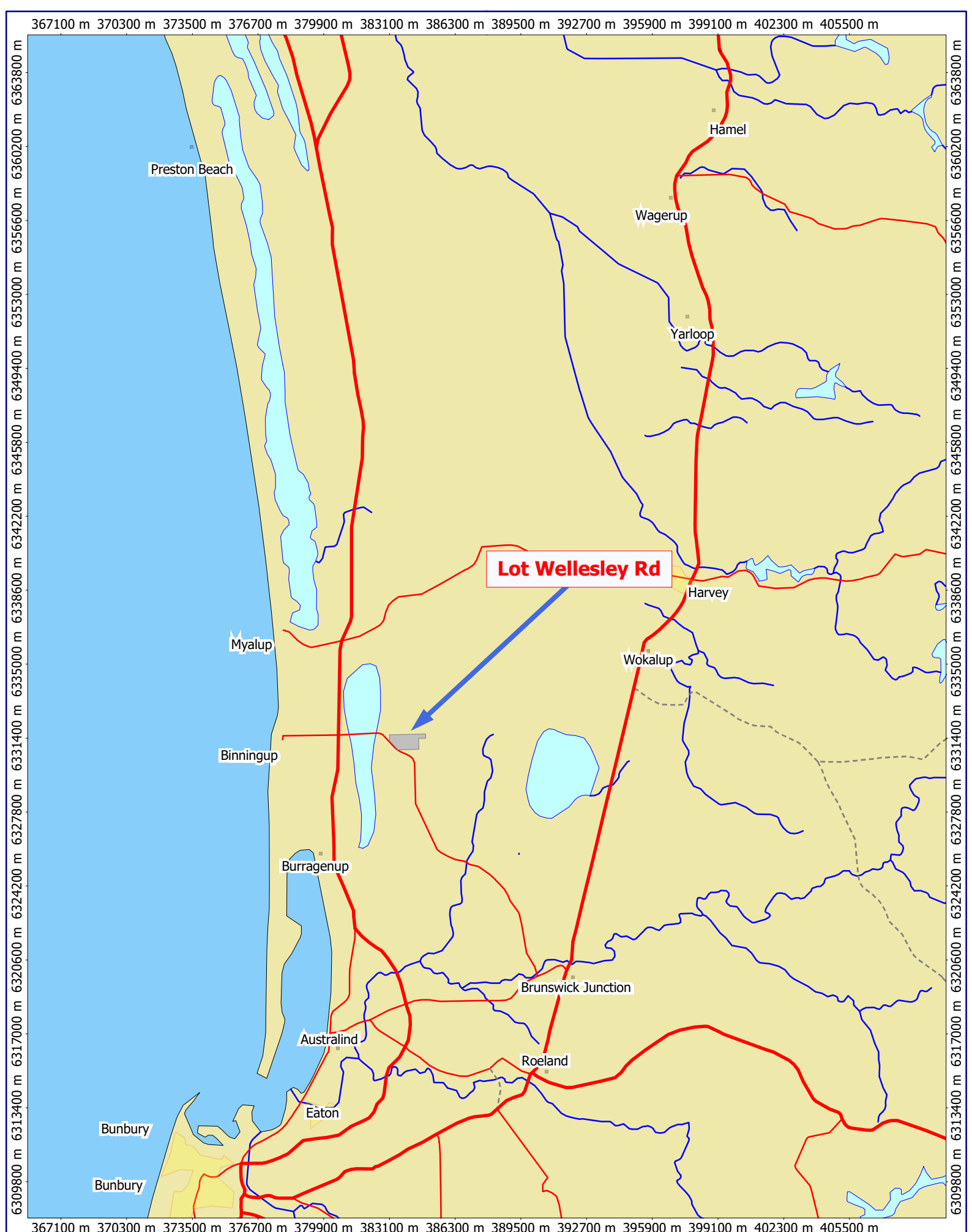
FIGURES



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Original Size: A4
Air Photo Source:
Datum: GDA94
Projection: Australia MGA94 (50)

Client: Carbone Bros
Project: Sand Extraction
Location: Lot 5 Wellesley Rd Wellesley

Figure 1:

Locality Plan

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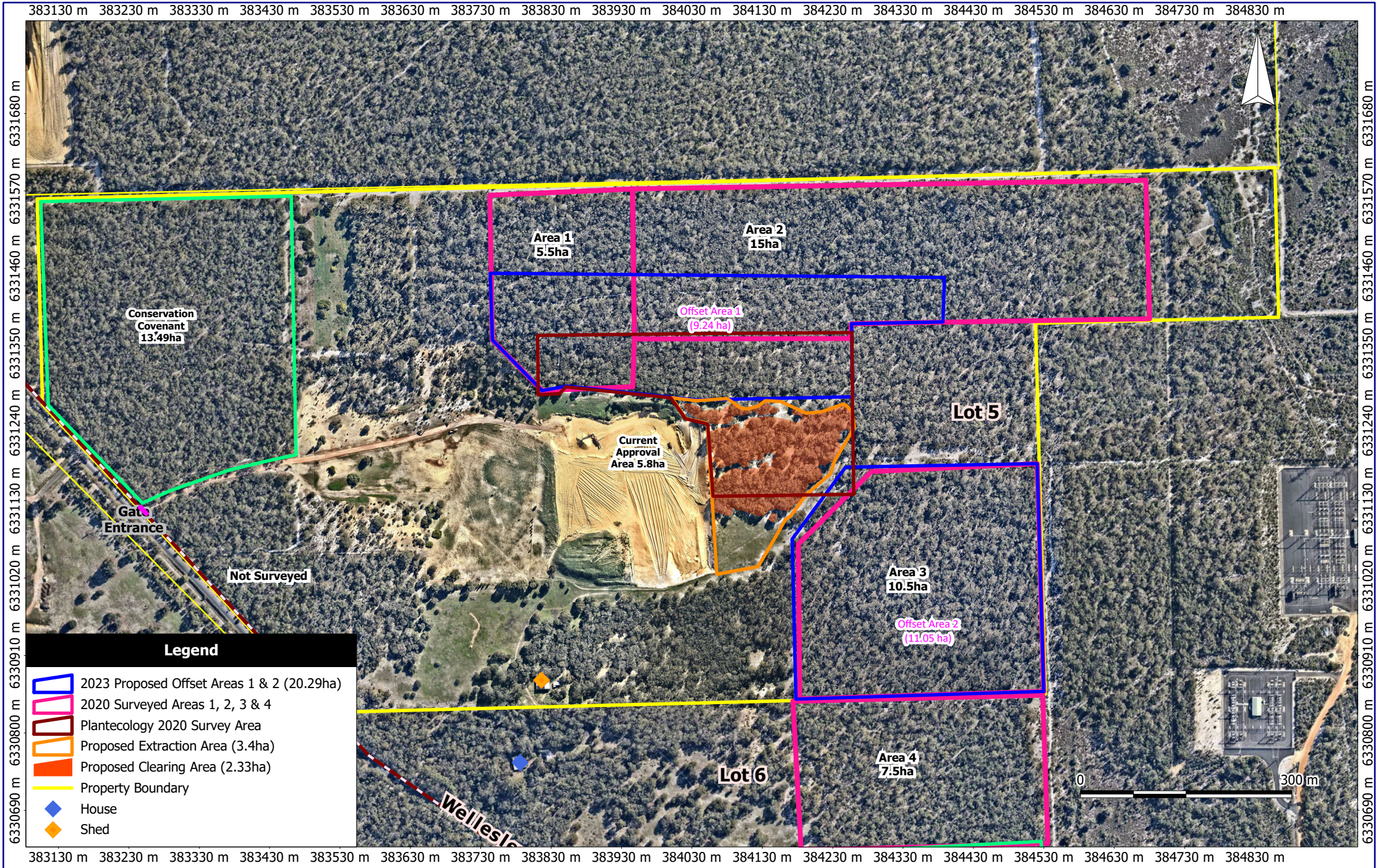

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Scale: 1:6600
Original Size: A4
Air Photo Date: Nearmap August 2023
Datum: GDA94
Projection: Australia MGA94 (50)

Client: Carbone Bros Pty Ltd
Project: Offset Proposal
Location: Lot 5 Wellesley Rd, Wellesley

Figure 2

Field Survey Areas for an Offset Proposal

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APPENDIX A

Lot 5 Wellesley Road, Wellesley Extraction Industry Licence Environmental Management Plan (EIL EMP)

APPENDIX B

Lot 5 Wellesley Road, Rehabilitation Management and Monitoring Plan

APPENDIX C

Lot 5 Wellesley Planning Consent and Conditions for Stage 10 Extraction

APPENDIX D

Evidence of engagement with Aboriginal Heritage Department

APPENDIX E

Greg Harewood Fauna Survey 2018

APPENDIX F

Flora and Vegetation Survey 2020

APPENDIX G

Lundstrom Environmental-Offset Natural Values Survey 2020

APPENDIX H

Greg Harewood Fauna Habitat Review 2022

APPENDIX I

EcoEdge Targeted Orchid Survey 2022

APPENDIX J

Fauna Management Plan

APPENDIX K

Offset Management Plan