Annual Compliance Report 2023 (Year 2)

Olive Downs Coking Coal Project - Stage 1 Offset Area

Prepared for: Pembroke Olive Downs Pty Ltd

Date: 1/10/2024

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1. Introduction

1.1 Project background

Pembroke Olive Downs Pty Ltd (Pembroke) owns and operates the Olive Downs Coking Coal Project (the Project), a greenfield metallurgical coal mine within the Bowen Basin, located approximately 40 kilometres (km) south-east of Moranbah, Queensland (**Figure 1.1**). The coal resource is being mined in stages by conventional open cut mining methods, with product coal to be transported by rail to the Dalrymple Bay Coal Terminal. The Project will produce up to 20 million tonnes per annum of run of mine coal over an anticipated operational life of approximately 79 years. The Project was determined a 'controlled action' due to potential for the mine to have a significant impact on Matters of National Environmental Significance (MNES) including threatened fauna species and a threatened ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An approval was granted by the Commonwealth Minister for the Environment on 14 May 2020 (EPBC 2017/7867) for the Project components being the mine site and access road. The action commenced in May 2022, which involved commencement of Stage 1 of the mine construction.

1.2 Purpose of this report

In accordance with the conditions of approval (EPBC 2017/7867) an offset is required for impacts to MNES in the Stage 1 mine area. An Offset Area Management Plan (OAMP) was prepared, *Stage 1 Offset Area Management Plan* (OAMP) (EMM 2020), which details the implementation of offset management activities and sets criteria to be met over the duration of the offset. The Stage 1 OAMP was approved by the then Department of Agriculture, Water and Environment, now the Department of Climate Change, Energy the Environment and Water (DCCEEW) on 24 December 2020.

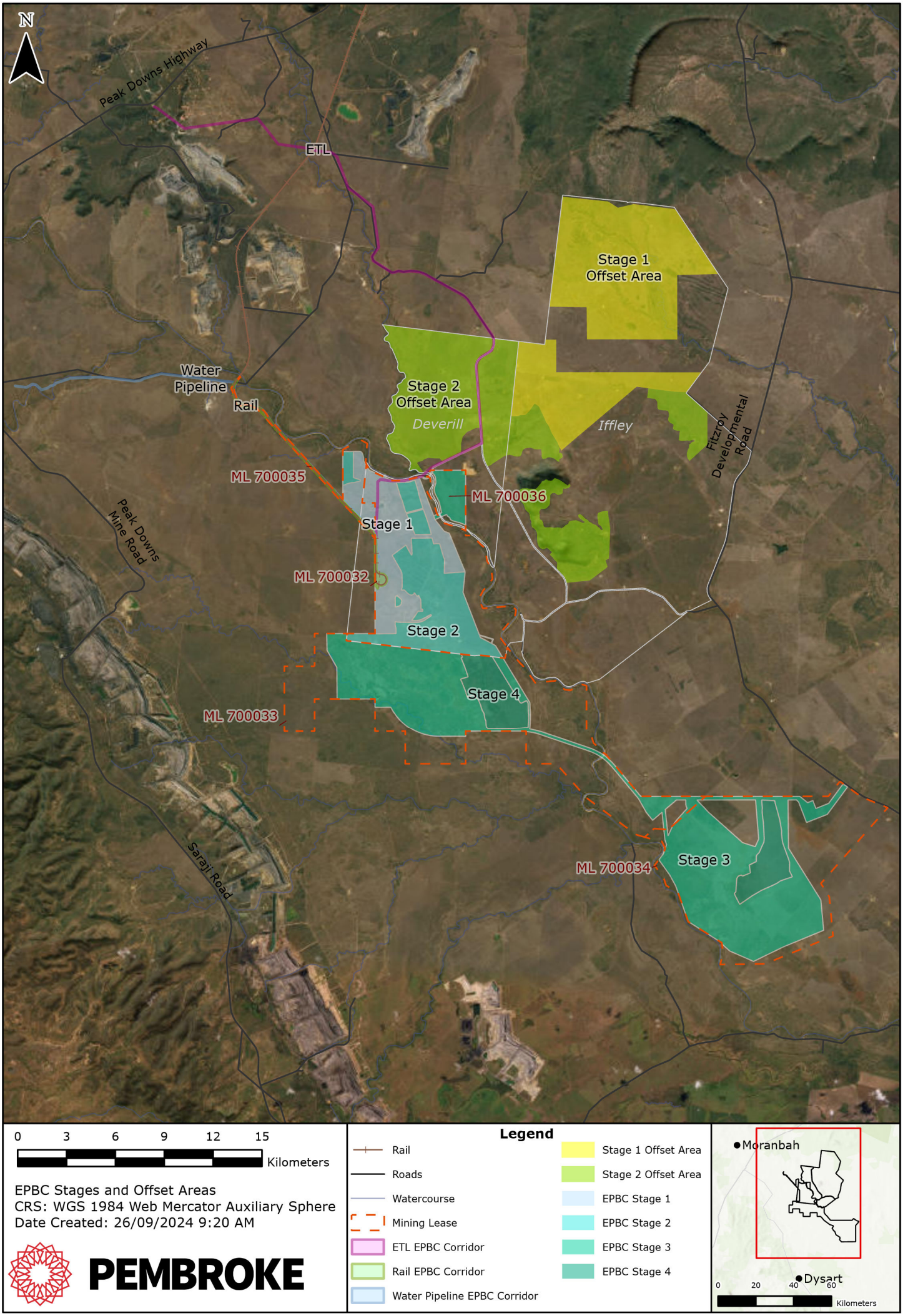
In accordance with the requirements of the OAMP, Pembroke is to conduct ongoing site management and monitoring of a range of activities (as described in Section 2).

At the conclusion of each year of activities (i.e. from March – March), an annual report is to be prepared to review activities undertaken during that period. The annual report is to provide a description of any management actions and/or monitoring activities that have been completed on the Stage 1 Offset Area and report on progress made towards achieving set performance outcomes and objectives as outlined in the OAMP.

Table 1.1 captures the annual reporting periods to date.

Table 1.1: Annual reporting of Stage 1 Offset Area

Year	Reporting period
1	February 2022 to February 2023
2	March 2023 to March 2024


N
Peak Downs Highway
ETL
Stage 1
Offset Area
Water
Pipeline
Rail
Stage 2
Offset Area
Deverill
Iffley
Fitzroy
Developmental
Road
ML 700035
ML 700036
Stage 1
Peak Downs
Mine Road
ML 700032
Stage 2
Stage 4
ML 700033
Saraji Road
ML 700034
Stage 3
0 3 6 9 12 15
Kilometers
EPBC Stages and Offset Areas
CRS: WGS 1984 Web Mercator Auxiliary Sphere
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PEMBROKE
Legend
Rail
Roads
Watercourse
Mining Lease
ETL EPBC Corridor
Rail EPBC Corridor
Water Pipeline EPBC Corridor
Stage 1 Offset Area
Stage 2 Offset Area
EPBC Stage 1
EPBC Stage 2
EPBC Stage 3
EPBC Stage 4
Moranbah
Dysart
0 20 40 60
Kilometers

2. Offset Area Management Plan

The Stage 1 OAMP includes a requirement for annual reporting of the site management and monitoring programs undertaken to improve and manage the offset area. These programs are undertaken in accordance with the OAMP (Table 4.1 and Table 4.3 of the OAMP) and include:

- weed monitoring and control
  - weed mapping survey
  - weed control
- biomass control and grazing management
  - ground cover and herbage mass % estimates to accompany the commencement / curtailment of grazing
- fire management
  - fuel load surveys
  - maintenance of fire breaks
- pest fauna management
  - baseline feral animal surveys
  - targeted pest control
  - cane toad tadpole trapping
- fencing
  - removal of barbed wire (or replacement with plain wire)
  - installation of exclusion fencing around MNES habitats
- monitoring of MNES fauna populations on site, including
  - ornamental snake (*Denisonia maculata*)
  - koala (*Phascolarctos cinereus*)
  - squatter pigeon (*Geophaps scripta scripta*)
  - Australian painted snipe (*Rostratula australis*)
  - greater glider (*Petauroides volans*)
- greater glider nest box installation.

Specifically, the OAMP requires the annual report to address the content outlined in Table 2.1. This annual report addresses the relevant items; Table 2.1 cross references where each content item is addressed in this report.

Table 2.1: Annual report content and where addressed in this report

Content	Cross reference
A description of all management actions that have been completed in that 12-month period	Section 4 and Appendix A
A description of the monitoring actions that were completed and results (Approval conditions for 2017/7867)	Sections 3 and 4, Appendix A
Habitat quality scores, using the Guide to Determining Terrestrial Habitat Quality (DEHP 2017), for those years where they are required, for each MNES species and how they are tracking against relevant interim 5-yearly goal	Not relevant for this report – habitat quality assessment not required in this period
Identification of any constraints to monitoring and management actions over that timeframe (e.g. high rainfall event therefore inability to access some areas due to flooding, etc)	Section 5
How any risks or threats have impacted on the area (eg drought period therefore lack of growth)	Section 5

Photos from photo monitoring points	Not relevant for this report – habitat quality assessment not required in this period
Identification of any risks or potential threats to the offset and offset values that have become apparent and how they will be addressed	Section 5.1
Any corrective actions implemented during the 12-month period	Section 5.2
Any learnings from the implementation of the OAMP and monitoring	Section 6
Any changes to the OAMP that may be proposed and justification	Section 6

This annual report is informed by reporting and management plans which were prepared to summarise the implementation of each activity; each report with relevance to Year 2 has been cited throughout, and the reports are available on request. Relevant reports for the Stage 1 Offset Area prepared for Year 2 are as follows:

- Olive Downs Offset Stage 1 Weed Management Plan (EMM 2022)
- Olive Downs Stage 1 *Offset Year 1 Annual Report* (EMM 2023a)
- Stage 1 Baseline Habitat Quality Monitoring Report (EMM 2023b)
- Olive Downs Stage 1 Offset Baseline Weed Survey Report (EMM 2023c)
- Olive Downs Stage 1 Offset Cane Toad trapping May 2023 (EMM 2023d)
- Olive Downs Stage 1 Offset Greater Glider nest box installation (EMM 2023e)
- Year 2 Feral Animal Survey Stage 1 Offset Area (EMM 2024a)
- Olive Downs Stage 1 – Year 2 – MNES monitoring report (EMM 2024b)
- Olive Downs Coking Coal Project Offset Stage 1 Nest Box Monitoring Report – Round 1 (EMM 2024c).

In accordance with the requirements of the OAMP, every 5 years, data from the annual reports will be summarised into a 5-yearly report to be submitted to Queensland's Department of Environment, Science and Innovation (DESI) and DCCEEW. The 5-year interim report will track the past 5 years of monitoring and management actions. It will include a more detailed assessment against the performance criteria and 5-year interim milestones for that project stage, any corrective actions that have been implemented, and any adaptive management learnings. The OAMP will be reviewed after each 5-yearly interim review to adapt to learnings and outcomes of that period, where required.

Details regarding each management and monitoring activity required summarised in Sections 2.1 to Section 2.8 and progress against targets from the OAMP are assessed in Section 4 and Appendix A .

2.1 Weed monitoring and control

Management of weeds is a key action that aims to address ongoing loss and degradation of habitat for MNES fauna species within the Stage 1 Offset Area (EMM 2020). Invasive weeds are identified as a key threat to the ornamental snake, Australian painted snipe and squatter pigeon. Weed monitoring across the Stage 1 Offset Area is to be conducted on an annual basis, and controls (e.g. herbicides) applied as necessary in line with the *Olive Downs Offset Stage 1 Weed Management Plan* (EMM 2022).

Baseline weed data was collected across the offset in 2022 at 49 permanent habitat quality (BioCondition) monitoring sites established in Year 1. Additionally, permanent photographic weed monitoring points were established at 20 locations of high ecological significance, such as riparian corridors. Collectively, this data forms the basis for future comparisons over the Project life to determine if management actions are resulting in a decline in weed abundance and/or diversity over time.

2.2 Biomass control and grazing management

Weeds and/or increased biomass is identified in the OAMP as key threats to the ornamental snake, Australian painted snipe and squatter pigeon, resulting in loss and degradation of habitat, loss of feed plants and loss of bare ground

important to foraging). Undertaking weed and biomass control is a key action to be undertaken to provide benefits for these threatened species.

Weed and fuel/biomass load is managed through a combination of the following:

- monthly fuel load monitoring undertaken through the quadrat sampling method described in OAMP; if areas are being grazed, quadrat sampling is required weekly;
- crash grazing which involves high stocking density in an area for short durations, and excluding stock from the area once grass cover and fuel loads reach the required level;
- slashing which involves mowing areas along boundaries or in areas where grazing is not practical; and
- where relevant, hazard reduction burns, including controlled burning, mechanical clearing and fuel load management and / or cool burns.

Refer to the OAMP for further information pertaining to biomass control and grazing management. Note that, as of the end of Year 2, fuel load monitoring and the associated strategies for fuel load reduction (crash grazing, slashing and hazard reduction burns) had not been employed on the Stage 1 Offset Area. However, cattle had been almost entirely excluded from MNES habitats through destocking by the end of Year 2. As such, biomass control and grazing management will not be discussed further in this report, apart from being assessed in Appendix A

.

2.3 Fire management

Management of bushfire regimes in the Stage 1 Offset Area (and surrounds on adjacent land owned by Pembroke) aims to reduce the likelihood of threatened species mortality, or loss of habitat due to uncontrolled bushfire. Fire management is also used as a method to control biomass and may be used as a part of an integrated management approach for key weed species (e.g. buffel grass). Key fire tracks were established in Year 1 and will be maintained each year thereafter. Other essential fire tracks may be added in following years if required. Hazard reduction burns prior to the dry season will be undertaken in those years where it is deemed necessary, and conditions are appropriate.

2.4 Pest fauna monitoring and management

Feral animal monitoring will determine the relative abundance and distribution of feral animals within the Stage 1 Offset Area. This is achieved by conducting repeatable diurnal and nocturnal survey transects along with the deployment of remote cameras. Feral animal monitoring is to be conducted on an annual basis. This data will subsequently inform any targeted pest control.

A cane toad tadpole trapping program commenced in Year 1, and trapping is to be conducted quarterly for the first 5 years of the offset.

2.5 Fencing

Fencing is an integral part of land management. Fences delineate legal boundaries and control access, restrict stock movements, and often provide access routes for land managers with tracks along fence lines. However, fences can restrict the movement of native wildlife, and can cause serious injury and deaths. Barbed wire is a major hazard for wildlife with more than 75 wildlife species identified in Australia as occasional or regular victims of barbed wire fences, especially nocturnal animals such as bats, gliders and owls (WFF 2024). The OAMP states that barbed wire fencing across the offset area is to be removed or replaced with plain or borderline (white plastic coated) wire within the first six months of Year 1.

2.6 Monitoring of MNES fauna on site

Biannual targeted surveys for all MNES fauna species (namely ornamental snake, koala, squatter pigeon, Australian painted snipe and greater glider) will be conducted and commenced in Year 2. Targeted surveys will assess species ongoing presence, abundance and habitat utilisation across the Stage 1 Offset Area.

2.7 Greater glider nest box installation and monitoring

A lack of naturally occurring large tree hollows renders some areas within the Stage 1 Offset Area unsuitable for greater glider denning. In recognition of this, a supplementary nest box program was proposed in the OAMP, intended to supplement denning and breeding habitat for the greater glider. After installation, monitoring and research will be undertaken to evaluate the success of these nest boxes for the species. In Year 1, a survey was completed to determine appropriate locations for installation of the nest boxes. In Year 2, nest boxes were installed, and monitoring of the nest boxes is planned to continue on a quarterly basis for the first two years following installation.

2.8 Baseline habitat quality monitoring of MNES habitats

Habitat quality assessments are to be conducted at 49 permanent monitoring sites on a biannual basis across the Stage 1 Offset Area. These sites were established during Year 1 and throughout Year 2; the process and associated habitat quality scoring is described in detail in the first annual report and the *Olive Downs Stage 1 Offset Baseline habitat quality monitoring report* (EMM 2023b). As such, habitat quality monitoring will not be discussed further in this report. Habitat quality monitoring via the reassessment of the 49 monitoring sites using BioCondition methodology will be discussed in the 2024 annual report (Year 3).

3. Methodology

Various management and monitoring surveys were conducted by suitably qualified ecologists during Year 2.

Climatic conditions during Year 2, based on information recorded at the Moranbah Airport weather station (weather station 034035), are summarised in Table 3.1.

Table 3.1: Weather conditions at Moranbah Airport weather station (034035) in 2023 / 2024

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Total rainfall (mm)	59.8 (100.7)	34.0 (36.4)	0.0 (34.5)	2.4 (22.1)	40.8 (18.0)	0.0 (25.0)	1.2 (9.1)	0.0 (35.7)	106.8 (69.3)	80.8 (103.9)	145.4 (103.8)	92.8 (100.7)
Mean minimum temp (°C)	20.3 (20.2)	16.8 (17.6)	8.9 (14.2)	11.8 (11.2)	10.5 (9.9)	9.4 (11.1)	12.7 (14.1)	15.5 (17.6)	19.6 (19.4)	21.4 (21.1)	22.9 (21.9)	21.8 (21.8)
Mean maximum temp (°C)	34.0 (33.1)	31.7 (29.5)	26.8 (26.5)	28.1 (23.7)	24.6 (23.7)	27.9 (25.5)	30.9 (29.2)	33.8 (32.3)	34.4 (33.1)	34.4 (33.9)	34.0 (33.9)	32.9 (33.1)

Units within brackets represent the meteorological averages between years 1972 - 2012 (rainfall) and 1986 – 2012 (temperatures) at Moranbah Water Treatment Plant (weather station 034038). This data was used instead of the Moranbah Airport (weather station 034035) data due to the lack of long-term climate and rainfall data. The Moranbah Airport weather station replaced the Moranbah Water Treatment Plant weather station in 2012.

Methods of management and monitoring applicable to each broad aspect of the OAMP are summarised in the subsections below. Full details of each management and monitoring action completed, including locations, personnel and detailed methodology are available on request in standalone reports as referenced in Section 2.

3.1 Weed monitoring and control

3.1.1 General weed surveys

Weed data on the Stage 1 Offset Area is to be collected with ESRI Field Maps whilst driving access tracks at ~10 km/h, scanning 100 m either side of driveable tracks. Where polygon and point data is collected, the vehicle must be stopped, and an assessment made. Further detail is contained within the *Olive Downs Stage 1 Offset baseline weed monitoring report* (EMM 2023c).

3.1.2 Permanent weed photo monitoring sites

Twenty permanent photo monitoring points have been sited at locations of high ecological significance, such as riparian corridors. At each monitoring point, georeferenced photos are taken at four bearings (north, east, south and west) along with the density scores for any priority species present. Further detail is contained within the *Olive Downs Stage 1 Offset baseline weed monitoring report* (EMM 2023c).

3.2 Biomass control and grazing management

Refer to the OAMP for details on planned biomass control and grazing management strategies; note that no activities were carried out in 2023 (Year 2), but that the Stage 1 Offset Area was almost entirely destocked by the end of the year.

3.3 Fire management

Key fire tracks across the Stage 1 Offset Area were maintained by Pembroke during 2023. Maintenance occurred in October and November 2023, prior to the onset of the wet season. Hazard reduction burns prior to the dry season will be undertaken in those years where it is deemed necessary, and conditions are appropriate.

3.4 Pest fauna monitoring and management

Details of the pest fauna monitoring conducted in 2023 are provided in the report *Year 2 Feral Animal Survey: Stage 1 Offset Area* (EMM 2024a). A summary is provided below.

3.4.1 Vehicle transects

Vehicle transects were 1 km in length and were each surveyed three times on separate nights. During each transect, the vehicle was driven at a maximum of 10km/h. A GPS track of the transect was recorded on a handheld GPS device. Both occupants of the vehicle scanned the track ahead and the surrounding habitat for feral animals, using the vehicle lights, high powered spotlights and headtorches. Animals were identified using binoculars when necessary. The location of each feral animal was recorded on a handheld GPS device. Other information recorded included the start and end time of each transect as well as the temperature and weather conditions at the time of survey. Sixteen vehicle transects were located along existing tracks in Area 1 (northern portion of the offset area). An additional eight transects were located in Area 2 (southern portion of the offset area).

3.4.2 Walking transects

Walking transects were each 1 km in length, and traversed areas difficult or impossible to access in vehicles. Each walking transect was surveyed once, with ecologists searching for feral animals or their distinctive sign with high-powered spotlights and headtorches. The transect was recorded on a handheld GPS device. Animals were identified using binoculars when necessary. The location of each feral animal was recorded on a handheld GPS device. Other information recorded included the start and end time of each transect as well as the temperature and weather conditions. Six walking transects were located along creek lines or forested areas in Area 1 (northern portion of the offset area). Two additional transects were located along a creek line and rocky ridge in Area 2 (southern portion of the offset area). Hereafter, vehicle and walking transects are referred to as 'line transects'.

3.4.3 Remote cameras

Twenty remote cameras were deployed along tracks, game trails and near water sources throughout the Stage 1 Offset Area. Cameras were attached to suitable trees or posts and, in general, were positioned approximately 0.5 m above ground level at a 45-degree angle. All cameras were unbaited. GPS coordinates of each deployed camera were recorded for subsequent survey replication.

3.4.4 Cane toad tadpole trapping

To mitigate the threat of cane toad poisoning of ornamental snake, it was proposed that cane toad tadpole trapping should be conducted in a series of locations across the Stage 1 Offset Area. In 2023, surveys were initially undertaken to identify waterbodies that contained cane toad tadpoles, with traps to be installed at each of these sites if cane toads were observed (EMM 2023d). During these surveys, 14 traps were deployed at 14 separate survey locations.

The cane toad trapping surveys involved the use of Watergum cane toad tadpole traps, which were installed at each identified site and left in situ for 4-8 hours. At the end of the trapping session each trap was removed, and the tadpoles collected. Any bycatch was quickly identified, removed and returned to the waterbody. Any cane toad tadpoles caught in the trap were identified, humanely euthanised using the fridge-freezer method and disposed of by burial.

3.4.5 Feral animal control

Following feral animal surveys, it was determined that no feral animal control (beyond the continuing trapping of cane toad tadpoles) was required on the Stage 1 Offset Area in 2023.

3.5 Fencing

No fencing works (i.e. removal of barbed wire fencing) were completed in 2023.

3.6 Monitoring of MNES fauna

Details of the MNES fauna monitoring conducted in Year 2 are provided in the report *Olive Downs Stage 1 - Year 2 - MNES monitoring report* (EMM 2024b). A summary is provided below.

All surveys were completed between 23 and 29 October 2023, with the exception of the surveys for ornamental snake and Australian painted snipe (wetland species depending on functional rain to complete survey). High rainfall in November and December 2023 prohibited site access; consequently, the Year 2 surveys for wetland species were completed between 22 February and 7 March 2024.

- Ornamental snake:
  - Targeted surveys for ornamental snake involved two ecologists spotlighting eight ~1 km transects and conducting eight ~30-minute nocturnal active searches within mapped suitable habitat for the species, which consisted of gilgai, wetland and riparian habitats.
- Koala:
  - Targeted surveys for koala involved two ecologists spotlighting 29 ~500 m transects within mapped koala (i.e. eucalypt woodland) habitat. Koala surveys were conducted at the same time as targeted surveys for greater glider.
- Squatter pigeon:
  - Targeted surveys for squatter pigeon included:
    - driving transects (seven vehicle transects with a total distance of 143.7 km)
    - active searches (14 x 2 ha area sites were actively searched for 30 minutes targeting Squatter pigeons. Each site was surveyed 4 times throughout October and March)
    - remote camera trapping (20 remote camera traps over approximately 30 days amounting to 600 trap days).
- Australian painted snipe:
  - Targeted surveys for Australian painted snipe included:
    - active flushing surveys and active searches (two ecologists spotlighting eight ~1 km transects and conducting eight ~30-minute nocturnal active searches within mapped suitable habitat for the species, which consisted of gilgai, wetland and riparian habitats)
    - remote camera trapping (20 remote camera traps over approximately 30 days amounting to 600 trap days).
- Greater glider:
  - Targeted surveys for greater glider involved two ecologists spotlighting 29 ~500 m transects within mapped Koala (i.e. eucalypt woodland) habitat. Greater glider surveys were conducted at the same time as targeted surveys for koala.

3.7 Greater glider nest box installation and monitoring

In accordance with the OAMP, to offset impacts to greater glider habitat on the Olive Downs mine site, nest boxes are to be installed in suitable habitat across the Stage 1 Offset Area. In June 2023, 56 nest boxes were successfully installed, primarily riparian areas to augment available habitat for the species and improve denning opportunities for greater glider (EMM 2023e). Each nest box was to be assessed by a suitably experienced fauna spotter catcher, and all sheltering animals identified and recorded. Any maintenance required for the box was also to be noted. Nest boxes were first inspected between 14 and 15 November 2023 (EMM 2024c).

3.8 Baseline habitat quality monitoring of MNES habitats

As discussed in Section 2.8, habitat quality monitoring was not required during the reporting period.

4. Results

4.1 Weed monitoring and control

Completion of baseline weed survey was undertaken in Year 2 as discussed in Section 3.1 and the preparation of the associated report. The baseline weed survey identified 11 species, seven of which are recommended for priority treatment and ongoing monitoring (EMM, 2023c). These include:

- Buffel Grass (*Cenchrus ciliaris*);
- Guinea Grass/Green Panic (*Megathyrsus maximus var. maximus, var. trichoglume*);
- Lantana (*Lantana camara*);
- Parthenium (*Parthenium hysterophorus*);
- Rubber Vine (*Cryptostegia grandiflora*);
- Velvety Tree Pear (*Opuntia tomentosa*); and
- Parksonia (*Parkinsonia aculeata*).

No weed management actions outlined in the *Weed Management Plan* (EMM, 2023) were implemented in Year 2.

4.2 Biomass control and grazing management

Refer to the OAMP for details on planned biomass control and grazing management strategies; note that none were carried out in 2023, but that the Stage 1 Offset Area was almost entirely destocked by the end of the year.

4.3 Fire management

Key fire tracks across the Stage 1 Offset Area were maintained by Pembroke during 2023. Maintenance occurred in October and November 2023, prior to the onset of the wet season. No hazard reduction burns were conducted.

4.4 Pest fauna monitoring and management

Detailed results of the pest fauna monitoring conducted in 2023 are provided in the report *Year 2 Feral Animal Survey: Stage 1 Offset Area* (EMM 2024a). A summary of these results is provided below.

4.4.1 Line transects

Seventy-two vehicle transects and eight walking transects (collectively, line transects) were completed as planned between 9 and 15 October 2023 by two suitably qualified ecologists. Each line transect was 1 km in length. Each of the 24 pre-allocated vehicle transects were surveyed three times (i.e. 72 vehicle transect surveys in total) on different nights to mitigate the potential impact of weather conditions, or other influence, on animal activity. The eight walking transects were each surveyed once. The total survey effort (i.e. vehicle and walking transects) was 80 transects or 80 km of line transect surveyed over six nights. Ecologists also recorded any feral animals seen on an incidental basis (e.g. while driving between vehicle transect locations or while installing remote cameras).

4.4.2 Remote cameras

Twenty remote camera traps, positioned in the same locations as during the Year 1 feral animal survey, were deployed across the Stage 1 Offset Area during the Year 2 feral animal survey. The unbaited camera traps were situated along vehicle access tracks, game trails and near water sources. The camera traps were deployed on 9 and 10 October 2023 and collected on 19 November 2023. Data was recorded by 17 cameras, while three experienced malfunctions. The resulting survey effort totalled 694 trap nights.

4.4.3 Pest fauna recorded

The *Year 2 Feral Animal Survey* (EMM 2024a) documented six pest fauna, and a total of 99 individuals. European rabbits were the most abundant feral animal encountered. A total of 53 individual rabbit sightings were recorded within the Stage 1 Offset Area, an increase of almost 400 % as compared to baseline 2022 data. Dingos/wild dogs (22 records) were the second highest recorded species. A summary of the feral animal survey is presented in Table 4.1.

Table 4.1: Year 2 pest fauna survey results

Pest fauna species	Camera trap records	Line transect records	Total
Dingo / wild dog	17	5	22
Feral cat	11	2	13
Feral pig	4	0	4
European Rabbit	5	48	54
Brown Hare	1	3	4
Cane Toad	0	3	3
Chital Deer	0	0	0
Red Fox	0	0	0
Total	-	-	**99**

Figure 4.1: Feral pig recorded on camera trap

4.4.4 Cane toad tadpole trapping

In total, 53 tadpoles were trapped and humanely euthanised from one location sampled (14 locations sampled in total).

4.4.5 Feral animal control

Following feral animal surveys, it was determined that no feral animal control (beyond the continuing trapping of cane toad tadpoles) was required on the Stage 1 Offset Area in Year 2.

4.5 Fencing

No fencing works were conducted on the Stage 1 Offset Area in Year 2.

4.6 Monitoring of MNES fauna

Results of the MNES fauna monitoring conducted in Year 2 are provided in the report *Olive Downs Stage 1 - Year 2 - MNES monitoring report* (EMM 2024b). A summary is provided below.

- Ornamental snake:
  - The surveys detected six ornamental snakes within the Stage 1 Offset Area. Locations of these records are available in EMM (2024b).
- Koala:
  - No koalas were detected during spotlighting surveys, however evidence of their presence (distinctive scratches on trees in suitable habitat, as well as scats) was noted by ecologists in several locations. Additionally, two koalas were detected incidentally within the offset area during the completion of other surveys; locations of all koala evidence and sightings are available in EMM (2024b).
- Squatter pigeon:
  - 48 squatter pigeons were recorded during driving transects and active searches. An additional 103 individuals were photographed by camera traps – but note many of these are likely to represent the same individuals photographed multiple times throughout a day or between days. 43 additional birds were recorded incidentally during other surveys. For a summary of the sighting locations, refer to EMM (2024b).
- Australian painted snipe:
  - No Australian painted snipe were detected during these surveys or incidentally in Year 2.
- Greater glider:
  - A total of 40 greater gliders were detected during targeted surveys, with an additional 82 incidental sightings of the species on site mentioned in EMM (2024b).

4.7 Greater glider nest box installation and monitoring

In June 2023, 56 nest boxes designed specifically for greater glider by Hollow Log Homes were successfully installed in primarily riparian areas to augment available habitat for the species and improve denning opportunities. Following installation, nest boxes were first inspected between 14 and 15 November 2023 using an elevated work platform.

Of the total 56 boxes inspected in November 2023, two were found to contain greater gliders (3.57 % occupancy rate). Individuals were observed in boxes that had been installed in *Corymbia clarksoniana* and *Eucalyptus tereticornis*.

Monitoring is set to continue quarterly for two years following installation (i.e., until Year 4 of the offset). The first monitoring event for Year 3 was planned for February 2024.

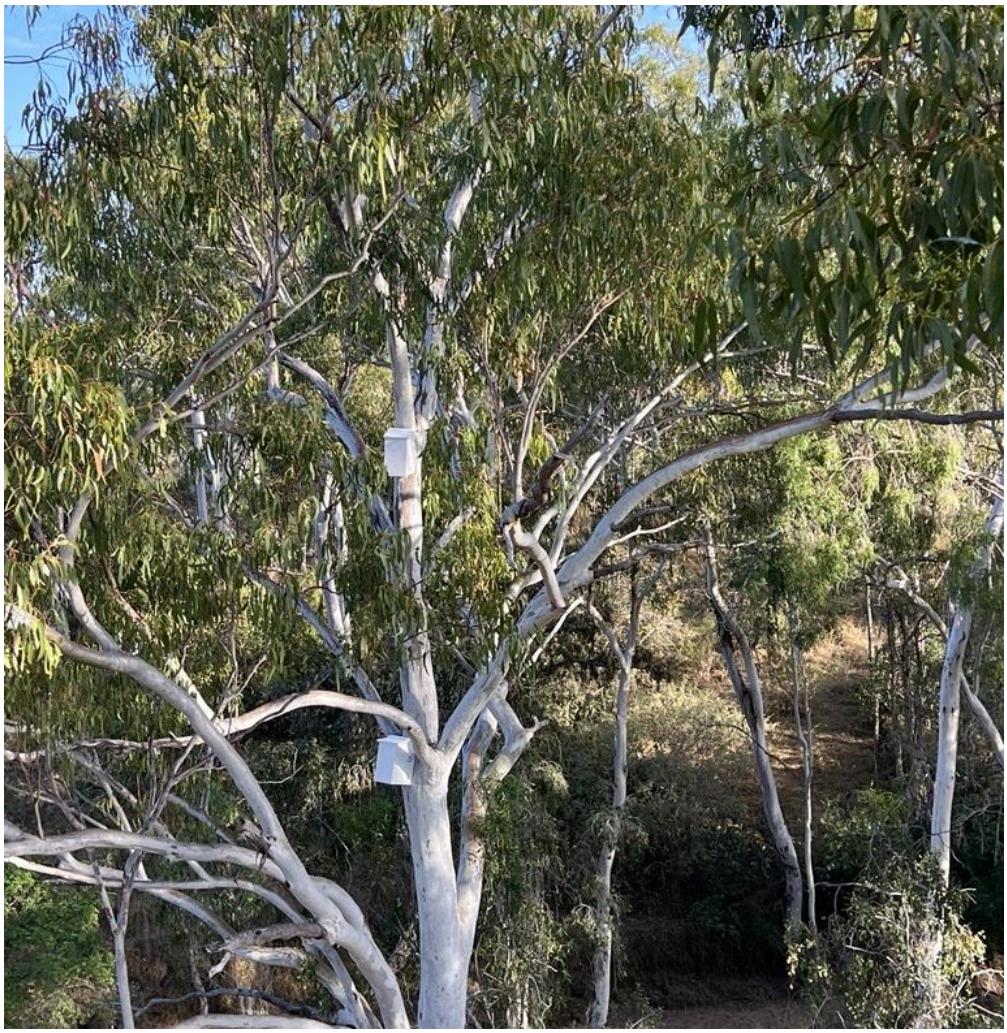

Figure 4.2: Two greater glider nest boxes installed in *Eucalyptus tereticornis*

4.8 Baseline habitat quality monitoring of MNES habitats

As discussed in Section 2, habitat quality assessment was not required during the reporting period.

5. Constraints to Monitoring and Management

Based on review of the management and monitoring actions described in Sections 3 and 4, there were no major constraints to monitoring and management identified during Year 2. Some minor constraints were identified due to limited access of the site following periods of heavy rain. These were responded to and managed during the surveys.

6. Conclusion and Recommendations

6.1 Weed monitoring and control

The *Year 1 Annual Report* (EMM 2023a) stated that "In general, the weed management area was found to have a high weed prevalence". Recommendations on targeted weed management in that report and in Table 4.1 of the *Olive Downs Stage 1 Offset Baseline Weed Survey Report* (EMM 2023c) should be adopted and incorporated into Pembroke's weed management strategy.

Weed monitoring did not occur in Year 2 but should be prioritised going forward in accordance with the OAMP annual weed monitoring requirements. The Weed Management Plan should continue to be updated annually as per the OAMP.

6.2 Biomass control and grazing management

Refer to the OAMP for details on planned biomass control and grazing management strategies; note that no activities were carried out in 2023, however the Stage 1 Offset Area was almost entirely destocked by the end of the year. A pastoral property manager was appointed in September 2023.

6.3 Fire management

Apart from track maintenance, no active fire management was conducted on the Stage 1 Offset Area during Year 2. However, wet conditions (due to an ongoing El Niño period) reduced the risk of fire to such an extent that further active fire management was considered unnecessary.

6.4 Pest fauna monitoring and management

The *Year 2 Feral Animal Survey* (EMM 2024a) documented six pest fauna, and a total of 99 individuals. European rabbits were the most abundant feral animal encountered. A total of 53 individual rabbit sightings were recorded within the Stage 1 Offset Area, an increase of almost 400 % as compared to baseline 2022 data. Such an increase would trigger the need for corrective action as per the OAMP; however, the increase of rabbit abundance is more likely the result of improved visibility caused by the dry survey conditions rather than an increasing population. Likewise, the high numbers of cane toads recorded during the wet season *Baseline Survey* compared to the dry season survey conducted in Year 2 is also more likely attributable to the dry survey conditions rather than a decline in the local cane toad population.

Corrective action within the Stage 1 Offset Area should be deferred until the outcome of the Year 3 pest fauna survey is available. Timing of the Year 3 survey is recommended to align with that of the wet season *Baseline Survey* or the dry season Year 2 survey to ensure comparable results. Following this survey, targeted pest control of rabbits may be recommended if numbers remain high.

No other corrective action triggers, such as instances of mortality in target matters due to feral animals (e.g. wild dog attack on koala) were identified. Additionally, there was no evidence of pest fauna-induced degradation of MNES fauna habitat (e.g. pig wallows in gilgai) observed.

As previously discussed in the conclusions of the Year 1 annual report, recent scientific research has indicated that most so-called 'wild dogs' in Australia are, genetically, considered to be 'pure' dingos (Cairns et al. 2022). Dingo numbers will continue to be monitored across the Stage 1 Offset Area but targeted control of this species is not required at present; there has been no evidence of dingo predation affecting any MNES on the offset area and there is anecdotal evidence that the dingo population is suppressing the populations of feral cats and feral pigs on site (Feral Vertebrate Reduction Contracting 2024).

Monitoring of feral animals on the Stage 1 Offset Area should continue on an annual basis until Year 5, with the next monitoring round planned for 2024.

6.4.1 Cane toad tadpole trapping

Results from the first round of trapping indicate that:

- Trapping should be conducted as close to the summer months as possible, when cane toads are actively breeding and present in large numbers. Trapping in warmer conditions should result in more tadpoles being trapped.
- Ecologists conducting the trapping should have the capacity to store large numbers of tadpoles humanely for daily transport – a dedicated cooler to be kept in the vehicle should be sufficient.
- Lures may be used at least twice if trapping duration is under 4 hours each time.
- Due to the size of the waterbodies selected for trapping in, the use of two traps at the same time (when situated at opposite ends of the waterbody) did not impact results and allowed for higher numbers of tadpoles to be collected.
- Cane toads on site are being predated by rakali (*Hydromys chrysogaster*).

Cane toad tadpole trapping should continue to occur on a quarterly basis for the first 5 years of the offset, as stipulated in the OAMP. The effectiveness of these measures will then be reviewed as part of the 5-yearly interim review phase, and the OAMP will be updated if required. To date, trapping results demonstrate that the activity is ineffective, with cane toads remaining prevalent and ongoing in the offset area. Updates to the OAMP will be justified if this measure is proposed to be removed from the Stage 1 OAMP and other plans.

6.5 Fencing

No fencing works have been undertaken so far. The OAMP (EMM 2020) states that barbed wire fencing across the offset area was to be removed or replaced with plain or borderline (white plastic coated) wire within the first six months of Year 1. This is therefore a priority management action; barbed wire fencing should be removed from the offset area as soon as possible.

6.6 Monitoring of MNES fauna

Each target species, except for the Australian painted snipe, was recorded on the Stage 1 Offset Area in Year 2. The Australian painted snipe is a cryptic, nomadic inhabitant of ephemeral and permanent wetlands of inland Australia. In the eBird database, there were no recorded observations of the species in Australia in 2022. This may indicate that individuals had moved to inaccessible inland locations (e.g. in the channel country) to breed. In this context, the lack of records in the offset area is expected.

The OAMP outlines a proposed survey schedule for the MNES fauna species. In Year 3 (2024-2025), monitoring is only required to be completed for squatter pigeon, though note that surveys for Australian painted snipe may also be required in the "warmer months between October to March" if conditions are suitable.

The OAMP should be reviewed while planning the Year 4 surveys to ensure that survey effort requirements are met. The suggestion in the Year 2 *MNES monitoring report* (EMM 2024b) that certain ornamental snake survey locations should be excluded in future surveys due to perceived lack of suitable habitat, should be re-evaluated. Ornamental snake has been observed in atypical habitats (i.e., in areas away from cracking clay soils) both on the Olive Downs mine site (pre-development) and on the Stage 1 Offset Area. It is therefore recommended that all survey locations should be retained for an additional year.

6.7 Greater glider nest box installation and monitoring

Fifty-six nest boxes designed for greater glider were successfully installed across the Stage 1 Offset Area in Year 2. Within six months, there was evidence of greater gliders utilising the nest boxes for denning purposes (two greater gliders were observed using different nest boxes) (EMM 2024c). Nest box monitoring will continue on a quarterly basis in Year 3, and 20 additional nest boxes will be installed in 'habitat restoration areas' by Year 10.

6.8 Habitat quality monitoring

As discussed in Section 2, habitat quality assessment was not required during the reporting period.

7. References

Cairns K, Crowther M, Nesbitt B, and Letnic M (2021), The myth of wild dogs in Australia: Are there any out there?, *Australian Mammalogy*, 44, 67–75.

EMM (EMM Consulting Pty Ltd) (2020), *Olive Downs Stage 1 Offset Area Management Plan (v3)*, report prepared by EMM for Pembroke Resources.

- 2022, *Olive Downs Offset Stage 1: Weed Management Plan*, report prepared by EMM for Pembroke Resources.
- 2023a, *Annual Report: Olive Downs Coking Coal Project - Stage 1 offset*, report prepared by EMM for Pembroke Resources.
- 2023b, *Olive Downs Stage 1 Offset: baseline habitat quality monitoring report*, report prepared by EMM for Pembroke Resources.
- 2023c, *Olive Downs Stage 1 Offset: baseline weed monitoring report*, report prepared by EMM for Pembroke Resources.
- 2023d, *Olive Downs Stage 1 Offset: cane toad trapping May 2023*, report prepared by EMM for Pembroke Resources.
- 2023e, *Olive Downs Stage 1 Offset Greater Glider nest box installation*, report prepared by EMM for Pembroke Resources.
- 2024a, *Year 2 Feral Animal Survey: Stage 1 Offset Area*, report prepared by EMM for Pembroke Resources.
- 2024b, *Olive Downs Stage 1 - Year 2 - MNES monitoring report*, report prepared by EMM for Pembroke Resources.
- 2024c, *Olive Downs Coking Coal Project Offset Stage 1: Nest Box Monitoring Report - Round 1*, report prepared by EMM for Pembroke Resources.

FVR (Feral Vertebrate Reduction Contracting) (2024), *Pembroke – Olive Downs – Feral animal control June 2024*, memo prepared by FVR for Pembroke Resources.

WFF (Wildlife Friendly Fencing) (2024), *Wildlife friendly fencing and netting*, available online: https://wildlifefriendlyfencing.org/, accessed 28/08/2024.

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Appendix A

Year 2 Compliance Summary

Table A.1: Olive Downs Stage 1 Offset Area progress table (Year 2)

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
Management actions			
Weed control	• Baseline weed mapping surveys. • Weed species will be managed in accordance with the project's weed management action plan. • Targeted weed control measures required annually, to avoid new areas of infestation and reduce weed cover across the offset area.	Non-compliant	• Baseline weed surveys completed as per Year 1 requirements (though the baseline survey was completed in Year 2). • Priority weed list updated (EMM 2023c). • No targeted weed control actioned in Year 2. • It is recommended that actions are undertaken to manage and minor weeds in Year 3 and ongoing in accordance with the Weed Management Plan.
Biomass control and grazing management	• Monthly fuel load monitoring via quadrat sampling to be conducted; fuel load monitoring on a weekly basis if areas are being grazed. • Minimise fuel loads through crash grazing, slashing and/or hazard reduction burns and cool burns. • Ensure cattle are excluded from major watercourses. Adjacent riparian areas (at least 50 m either side of any major water source) will be fenced off. Off-stream watering points will be installed to ensure cattle have adequate access to water. • During set times of year (wet season) or following significant rainfall (>50 mm in 7 days), grazing will be excluded in gilgai areas to ensure gilgai habitats are protected.	Non-compliant	• No fuel load monitoring has been conducted. • Reduction of fuel load has not occurred. • Cattle were largely excluded from the offset area in stages throughout Year 2; very few now remain. They are also excluded along riparian areas. • It is recommended that biomass control and grazing management is implemented in accordance with the OAMP.
Fire management	• Educate employees and contractors on general fire awareness and response procedures.	In progress	• Employees and contractors visiting the Stage 1 Offset Area receive fire response education as a part of site induction procedures.

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
	• Create and maintain fire tracks (fire breaks) for fire control. • Reduce fuel loads when required (see biomass control above). • Hazard reduction burns. • Mosaic burning.		• Designated fire breaks were examined and maintained in Year 2. • Due to ongoing El Nino conditions, active fire management (reduction of fuel loads, hazard reduction burns, mosaic burning) was not required in Year 2.
Pest fauna management	• Baseline pest fauna surveys undertaken in Year 1. • Pest fauna survey then required on an annual basis until Year 5. • Species specific management controls to be implemented following yearly monitoring surveys (when required). • Cane toad tadpole trapping to be conducted on a quarterly basis until Year 5.	Compliant	• Pest fauna survey was carried out in Year 2; recommendation made to match timing of either Year 1 (wet season) or Year 2 (dry season) survey in future to allow for direct comparisons. • Cane toad tadpole trapping was successfully conducted in May 2023 and March 2024.
Fencing	• Fencing to be maintained to allow grazing to be managed. • Fences with barbed wire to be replaced with top strands with no barbed wire within first 6 months of Year 1.	Non-compliant	• No barbed wire had been removed from the offset area by the end of Year 2. • It is recommended that barbed wire be removed in accordance with the OAMP.
Monitoring actions			
Offset administration			
Confirm all prescribed management actions have been completed in timeframes set for that 12-month period	• All set management actions required in each 12-month period will be evaluated to confirm they have been completed. • A suitably qualified person will be engaged by Pembroke Resources to inspect the offset area and confirm work has been completed. • Audit will occur on an annual basis.	Non-compliant	• No annual audit of required management actions was prepared for Year 2. • It is recommended that an audit is completed during the Year 3 period.

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
Assess effectiveness and timing of environmental controls implemented	• After each monitoring event, the results will be evaluated and measured against the specific management outcomes for that particular matter.	Compliant	• Addressed in each report prepared regarding Year 2 actions (refer to documents outlined in Section 2.1 of this report). • Summarised in this report.
Ecosystem health			
Weeds	• Weed baseline survey across offset area – infestations to be mapped. • Permanent weed monitoring transects to be established. • Photo monitoring points to be established. • Weed monitoring survey conducted on an annual basis.	Non-compliant	• Baseline surveys completed in 2023 (one year behind schedule). • Transects and monitoring points established. • No weed monitoring or control conducted in Year 2. • It is recommended that activities are undertaken to manage weeds in accordance with the Weed Management Plan.
Pest fauna	• Pest fauna survey methodology finalised; baseline survey completed in Year 1. • Pest fauna survey then required on an annual basis until Year 5. • Species specific management controls to be implemented following yearly monitoring surveys (when required). • Cane toad tadpole trapping to be conducted on a quarterly basis until Year 5.	Compliant	• Pest fauna survey completed in Year 2. • Cane toad tadpole trapping methodology established; trapping commenced.
Fire	• Fire track maintenance required annually. • Fuel load assessment required quarterly. • Fuel load reduction (see Fire management, above) employed when required.	In progress	• Fire track maintenance conducted in Year 2. • No fuel load assessment conducted.
Grazing	• Monitor fuel loads via biomass method using quadrats and assessing groundcover and grass height. This is to be completed by the grazing	Non-compliant	• Pastoral property manager appointed September 2023. • No monitoring of fuel loads.

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
	manager quarterly (in absence of grazing) and weekly (when cattle are allowed to graze). • Survey fences and confirm adequate maintenance, and that cattle are excluded from sensitive MNES habitats (e.g. watercourses, gilgai). • Assess grazed areas for effectiveness in managing fuel load and that no degradation to environmental values is occurring. • Quarterly checklist to be filled out by grazing manager that will include: – Weather conditions – Grazing intensity and stock rotation – Fuel load levels at commencement of grazing and completion of grazing and duration (including photos) – Report on general property maintenance activities such as fencing, access track maintenance etc.		• See Fencing section above for summary of fencing actions. • No survey of grazed areas conducted in Year 2. • No quarterly checklist completed in Year 2. • It is recommended that biomass control and grazing management is implemented in accordance with the OAMP.
Ornamental snake	• Weed invasion / occurrence in ornamental snake habitat assessed as part of weed survey. • Condition of gilgai to be monitored for degradation from cattle, feral pigs or deer. • Permanent spotlighting transects will be established across the MNES habitat area. These will be surveyed at each survey period to support an estimate of population numbers, and how these are changing over time. • Locations of ornamental snake sightings recorded to assess habitat utilisation and dispersal.	Compliant	• Weed baseline survey completed. • No evidence of habitat degradation observed (EMM 2024a). • Transects established and locations reported (EMM 2024b). • Targeted survey for the species conducted by two ecologists (EMM 2024b), including: – 9 transects (3 nights survey) – 9 active searches (3 nights survey). • Targeted survey effort deemed sufficient; 6 ornamental snakes seen. • Locations provided.

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
Koala	• Weed invasion / occurrence in koala habitat assessed as part of weed survey. • Complete koala surveys to determine the presence of the species within the offset area (various methods). • Location of koala sightings recorded to assess habitat utilisation and dispersal.	Compliant	• Weed baseline survey completed. • Koala evidence and individuals detected on site during surveys (EMM 2024b); spotlighting the primary methodology employed. • Locations provided.
Squatter pigeon	• Weed invasion / occurrence in squatter pigeon habitat assessed as part of weed survey. • Complete squatter pigeon surveys to determine the presence of the species within the offset area (various methods). • Location of squatter pigeon sightings recorded to assess habitat utilisation and dispersal.	Compliant	• Weed baseline survey completed. • Squatter pigeons detected on site during targeted surveys (EMM 2024b). • Locations provided.
Australian painted snipe	• Weed invasion / occurrence in Australian painted snipe habitat assessed as part of weed survey. • Complete Australian painted snipe surveys to determine the presence of the species within the offset area (various methods). • Location of Australian painted snipe sightings recorded to assess habitat utilisation and dispersal.	Compliant	• Weed baseline survey completed. • No Australian painted snipe detected on site during targeted surveys (EMM 2024b).
Greater glider	• Weed invasion / occurrence in greater glider habitat assessed as part of weed survey. • Complete greater glider surveys to determine the presence of the species within the offset area (various methods). • Location of greater glider sightings recorded to assess habitat utilisation and dispersal.	Compliant	• Weed baseline survey completed. • Greater glider evidence and individuals detected on site during surveys (EMM 2024b); spotlighting the primary methodology employed. • Locations provided. • 56 greater glider nest boxes installed in Year 2 (EMM 2023e).

Management or monitoring measure required by OAMP	Management or monitoring implementation	Compliance	Comments
	• Nest box installation and occupation monitoring.		• Monitoring detected occupation of two nest boxes by the species (EMM 2024c).