GOVERNMENT OF WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986 (WA)(CI)

Purpose Permit number:	CPS 3290/4
Permit Holder:	Phosphate Resources Limited trading as Christmas Island Phosphates
Duration of Permit:	From 31 August 2009 to 26 June 2034

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of phosphate mining, stockpile access, and rehabilitation within the following areas, as shown within the combined areas cross-hatched yellow in Figures 1 to 2 of Schedule 1:

133A-MCP-STP22P
133A-MCP-STP23P
133A-MCP-STP9A
133A-MCP-STP9C
133A-MCP-FIELD9MB1
100-MCP-SP-SOUTH-MB1
100-MCP-SP-SOUTH-MB2
100-MCP-SP-CENTRAL-MB1
100-MCP-SP-CENTRAL-MB2
100-MCP-SP-CENTRAL-MB3
100-MCP-SP-EAST-MB3
100-MCP-SP-EAST-MB4

2. Land on which clearing is to be done - phosphate mining and stockpile access

The permit holder is authorised to clear for the purposes of phosphate mining and stockpile access within Mining Tenement MCA 70/1A, Christmas Island.

3. Land on which clearing is to be done – rehabilitation of relinquished areas

The permit holder is authorised to clear for the purpose of rehabilitation only within areas relinquished from Mining Tenement MCA 70/1A, Christmas Island.

4. Clearing authorised (extent)

The permit holder must:

(a) prior to 28 February 2027, not clear more than 30 hectares of *native vegetation*, within the combined areas cross-hatched yellow in Figure 1 and Figure 2 of Schedule 1

(b) from 28 February 2027, and subject to *CEO* approval, not clear more than 173.1 hectares of *native vegetation* within the combined areas cross-hatched yellow in Figure 1 and Figure 2 of Schedule 1, inclusive of the 30-hectare *native vegetation clearing* limit referred to under *condition* 4(a)

(c) not clear any *native vegetation* beyond the extent specified under *condition* 4(a), unless approved by the *CEO*

(d) in requesting the *CEO*'s approval under *condition* 4(b) and/or *condition* 4(c), provide to the *CEO* all survey reports and available data that relates to giant gecko (*Cyrtodactylus sadleiri*) surveys commissioned by Phosphate Resources Limited.

5. Clearing not authorised

The permit holder must demarcate the areas approved to clear under this permit, or otherwise put in appropriate controls, prior to *clearing* and must not clear any *primary rainforest* under this permit.

6. Stockpile access

To facilitate future revegetation, within six months of undertaking the required *clearing* of areas for stockpile access, the permit holder shall return these areas to natural ground level where the *clearing* lies within 50 metres of the Christmas Island National Park.

7. Staged clearing

For the areas authorised to clear for phosphate mining under this permit, the permit holder must commence phosphate mining activities within six (6) months of the *clearing* of these areas being undertaken, where practicable.

PART II – MANAGEMENT CONDITIONS

8. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the *clearing* of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of *clearing* on any environmental value.

9. Weed management

(a) When undertaking any *clearing*, or other activity under this permit, the permit holder must take the following steps to minimise the risk of the introduction and spread of weeds:

(i) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(ii) ensure that no *weed*-affected *mulch*, *fill* or other material is brought into the area to be cleared; and

(iii) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

(b) Weed management activities must be undertaken by the permit holder in accordance with the *Environmental Management Plan*.

10. Fauna Management - directional clearing and timing of clearing

The permit holder must:

(a) conduct *clearing* activities authorised under this permit in a slow, progressive manner, from one side of the *clearing* area to the other, towards adjacent *native vegetation*, to allow fauna to move into adjacent *native vegetation* ahead of the *clearing* activity; and

(b) restrict *clearing* activities to day-light hours to minimise the risk of injury to fauna.

11. Fauna management – robber crab (*Birgus latro*)

The permit holder must:

(a) engage a fauna spotter to traverse the areas cross-hatched yellow in Figures 1 to 2 of Schedule 1 to identify the robber crab immediately prior to, and for the duration of *clearing* activities; and

(b) where the robber crab is identified under *condition* 11(a), ensure the fauna spotter removes and relocates robber crabs to an area located 50 metres or more outside of the areas to be cleared, prior to commencing *clearing*.

12. Fauna management – Abbott's booby (*Papasula abbotti*)

The permit holder must:

(a) engage a *fauna specialist* to undertake a survey of *Abbott's booby suitable habitat* prior to *clearing*, for evidence of Abbott's booby nesting.

(b) where evidence of Abbott's booby nesting is identified under *condition* 12(a):

(i) not clear within 50 metres of any Abbott's booby nest site under this permit, unless otherwise approved by the *CEO*

(ii) undertake the following measures to facilitate timely revegetation within 100 metres of the Abbott's booby nest site:

(A) ensure that at least 1 metre of soil profile remains on top of the pinnacle in areas that have been cleared and mined under this permit, excluding *legacy pinnacle / fern fields*, within six (6) months post completion of phosphate mining;

(B) maintain vegetative material stockpiles from *clearing* activities under this permit, within or adjacent to the cleared areas, for use in rehabilitation;

(C) provide the vegetative material referred to under *condition* 12(b)(i)(B) to *Parks Australia*; and

(D) ensure that rehabilitation earthworks are commenced within 28 days of a work order being received from *Parks Australia* post relinquishment where safe and practicable.

(c) where Abbott's booby is identified under *condition* 12(a), include the following in a report submitted to the *CEO*:

(i) the number of nests identified;

(ii) the date each nest was identified;

(iii) the location where each nest was identified, recorded using a GPS unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(iv) measures taken to provide a 50-metre buffer between any nest identified and *clearing* activities, unless otherwise approved by the *CEO* under *condition* 12(b); and

(v) measures taken in accordance with *condition* 12(b)(ii).

13. Fauna Management – red crab (*Gecarcoidea natalis*)

Prior to undertaking any *clearing* authorised under this permit between 1 December and 28 February of each year, the permit holder must liaise with *Parks Australia* regarding agreed management measures to minimise the mortality to red crabs during migration and periods of high crab activity.

14. Environmental values avoidance buffers

The permit holder must maintain a 5-metre avoidance buffer between the boundary of the Christmas Island National Park and any *clearing* undertaken under this permit.

15. Flora management - *Tectaria devexa* var. minor

The permit holder must:

(a) engage an *environmental specialist* to survey areas of *Tectaria devexa var. minor suitable habitat* prior to *clearing*;

(b) not clear within 10 metres of any known *Tectaria devexa* var. minor locations under this permit unless otherwise approved by the *CEO*

(c) not clear within 50 metres of any known *Tectaria devexa* var. minor locations under this permit where the vegetation proposed to be cleared is *contiguous with* the patch of vegetation comprising the *Tectaria devexa* var. minor known locations, unless otherwise approved by the *CEO*.

(d) where *Tectaria devexa var. minor* is identified under *condition* 15(a), include the following in a report submitted to the *CEO*:

(i) the number of individuals identified;

(ii) the date each individual was identified;

(iii) the location where each individual was identified, recorded using a GPS unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees; and

(iv) measures taken to provide a 10-metre and 50-metre buffer between any individuals identified and *clearing* activities under this permit, unless otherwise approved by the *CEO* under *condition* 15(b) and *condition* 15(c), respectively.

PART III - RECORD KEEPING AND REPORTING

16. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised *clearing* activities generally	(a) the location where the *clearing* occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; (b) the date that the area was cleared; (c) the size of the area cleared (in hectares); (d) the purpose of the *clearing* undertaken; (e) the location of areas authorised to clear under this permit that have been relinquished from Mining Tenement MCA 70/1A, using a GPS unit set to GDA 2020, expressing the geographical coordinates in Eastings and Northings; (f) the date that any areas authorised to clear under this permit were relinquished from Mining Tenement MCA 70/1A; (g) actions taken to avoid, minimise, and reduce the impacts and extent of *clearing* in accordance with *condition* 8; (h) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with *condition* 9; and (i) actions taken in accordance with *conditions* 5, 6, 7, 10, 11, 13, and 14.
2.	In relation to fauna management (Abbott's booby) pursuant to *condition* 12	(a) results of the pre-clearance fauna inspection undertaken in accordance with *condition* 12; and (b) a copy of the fauna report in accordance with *condition* 12.
3.	In relation to flora management pursuant to *condition* 15	(a) results of the pre-clearance flora survey undertaken in accordance with *condition* 15; and (b) a copy of the flora report in accordance with *condition* 15.

17. Reporting

(a) The permit holder must provide to the *CEO* on or before 30 June of each year, a written report containing:

(i) the records required under *condition* 16; and

(ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.

(b) If no *clearing* authorised under this permit has been undertaken, a written report confirming that no *clearing* under this permit has been carried out, must be provided to the *CEO* on or before 31 December of each calendar year.

(c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of this permit, a written report of records required under *condition* 16, where these records have not already been provided under *condition* 17(a).

DEFINITIONS

In this permit, the terms in Table 2 below have the meanings defined.

Table 2: Definitions

Term	Definition
Abbott's booby suitable habitat	means vegetation within, or within 100 metres of, the areas cross-hatched yellow in Figures 1 to 13 of Schedule 1, that provides suitable habitat for Abbott's booby nesting, as described in the 'Conservation Advice for Abbott's Booby – *Papasula abbotti'* Commonwealth of Australia, 2020.
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the EP Act.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
contiguous with	means vegetation that is joined to vegetation within the area approved to clear under this permit, without separation of a road or other substantial access track or infrastructure.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
environmental management plan	means the plan titled 'Christmas Island Phosphates Environmental Management Plan 2018-2023 (December 2017)', or any updated version of this plan as approved by the relevant Commonwealth department.
EP Act	*Environmental Protection Act 1986* (WA)(CI).
fauna specialist	means a person who has appropriate training in fauna identification and surveys of fauna native to Christmas Island, or who is approved by the *CEO* as a suitable fauna specialist.
fill	means material used to increase the ground level, or to fill a depression.
legacy pinnacle / fern fields	areas mined but with some soil remaining and small soft pinnacles if any, sometimes with dense beds of the fern *Nephrolepsis*. Generally, poor regrowth.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.

Term	Definition
Parks Australia	means the Commonwealth Parks Australia corporation, established under the *Environment Protection and Biodiversity Conservation Act 1999*.
primary rainforest	means undisturbed closed canopy evergreen forest, as referenced in the document titled 'Supporting document for Amendment to CPS 3290/3. Christmas Island Phosphates. December 2024'.
Tectaria devexa var. minor suitable habitat	means vegetation within, or within 50 metres of, the area labelled '100-MCP-SP-CENTRAL-MB2', as shown cross-hatched yellow in Figure 2 of Schedule 1, that provides suitable habitat for flora species *Tectaria devexa* var. minor, as described in the document titled 'Supporting document for Amendment to CPS 3290/3. Christmas Island Phosphates. December 2024'.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) referred to as a weed in the document titled 'Christmas Island Phosphates Weed Management. Approaches and Risk Reduction in Mining Areas of Christmas Island (January, 2017); or (c) not indigenous to the area concerned.

END OF CONDITIONS

Meenu Vitarana
A/SENIOR MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986 (WA)(CI)

29 August 2025

Schedule 1

The boundary of the areas authorised to be cleared are shown in the maps below (Figures 1 and 2).

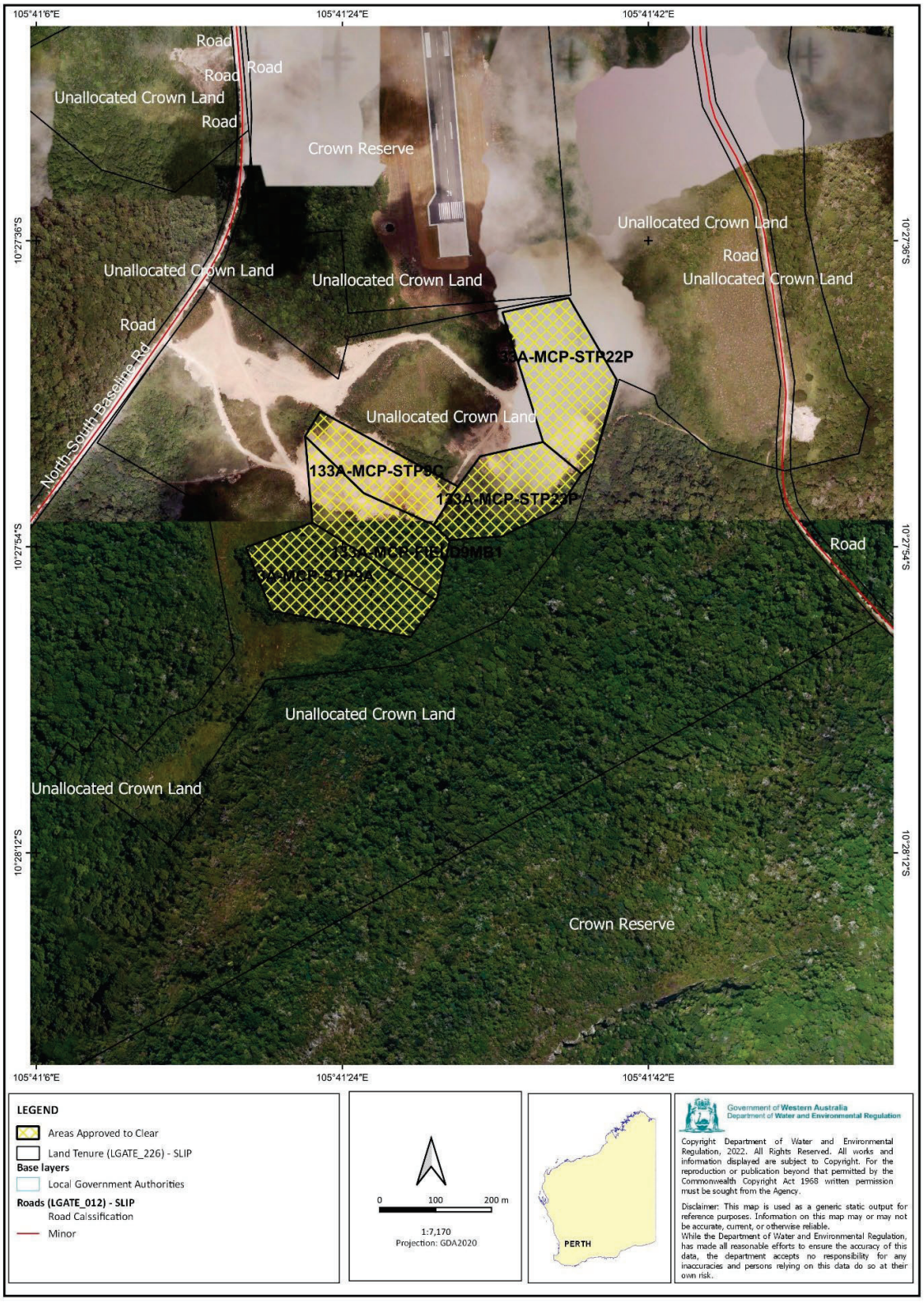

Figure 1: Map of the boundary of the areas within which *clearing* may occur (cross-hatched yellow).

Figure 2: Map of the boundary of the areas within which *clearing* may occur (cross-hatched yellow).

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Amendment Decision Report

1 Application details and outcome

1.1. Amendment application details

Permit number:	CPS 3290/4
Permit type:	Purpose permit
Applicant name:	Phosphate Resources Limited
Amendment Application received:	31 December 2024
Application areas:	173.1 hectares of native vegetation
Purpose of clearing:	Phosphate mining, stockpile access and rehabilitation
Method of clearing:	Mechanical
Property:	Mining Lease - MC1 70/1A Christmas Island
Location (LGA area/s):	Shire of Christmas Island
Localities (suburb/s):	Christmas Island

1.2. Description of the amendment

The original clearing permit, CPS 3290/1, allowed for the clearing of up to 173.1 hectares of native vegetation across 12 areas on Christmas Island to allow for phosphate mining and stockpile access, subject to conditions. Since the original permit was granted, two further amendments were undertaken on the clearing permit:

- CPS 3290/2 - granted April 2014, to extend the permit duration until April 2019; and
- CPS 3290/3 - granted July 2017, to further extend the permit duration until 31 August 2025.

This amendment application is largely to (Christmas Island Phosphates (CIP), 2024):

- extend the duration of the permit until 26 June 2034, to align with the expiry of the current approved mining lease MC1 70/1A (mining lease) within which the application areas occur
- remove management conditions relating to the Christmas Island Pipistrelle (*Pipistrellus murrayi*)) which are no longer relevant to the proposed clearing, noting this species was declared extinct in 2021 (further information provided in Section 3.2.1).
- remove a weed management sub-condition noting the applicant now has a Commonwealth approved environmental management plan (EMP), which sets out the applicant's commitment to undertake specific weed management actions associated with its mining operations on Christmas Island.
- revise a condition relating to threatened flora buffers to allow the applicant to request formal approval from DWER to encroach on buffers in specific instances, such as when a road clearly separates the application area from a vegetative patch containing threatened flora.
- include rehabilitation as a purpose of the permit for the southern portion of the 100-MCP-SP-SOUTH-MB2 application area, noting it has been relinquished to Parks Australia for rehabilitation. Parks Australia has requested the applicant retain the relinquished area in the amendment application, noting some initial clearing of this area is likely to be required to facilitate rehabilitation.

The applicant has either not commenced or completed its mining activities within several of the application areas and has cleared 21 hectares of the areas approved for clearing to date (CIP, 2024).

The vegetation proposed to be cleared is shown in Figures 1 to 2 within Section 1.5.

1.3. Decision on application

Decision:	Granted
Decision date:	29 August 2025
Decision area:	173.1 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit amendment application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (WA)(CI)(EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for:

- the site characteristics (see Appendix A)
- relevant datasets (see Appendix D)
- supporting information provided by the applicant, including a field reconnaissance survey by Christmas Island Environmental Services and photographs of the application areas (CIP, 2024)
- the clearing principles set out in Schedule 5 of the EP Act (see Appendix B)
- that the amendment does not propose to undertake additional clearing beyond that previously approved
- that the application area is within the confines of the applicants mining lease, which is valid until 2034
- that the proposed phosphate mining occurs within areas that have been historically used for phosphate mining at some point over the last 30 years
- planning instruments and other matters considered relevant to the assessment (see Section 3.3).

Noting the time between the original assessment of CPS 3290/1 (granted in 2009) and the current amendment application, DWER has deemed it appropriate to undertake a re-assessment of the proposed clearing in this instance.

The assessment identified that the proposed clearing would result in:

- potential impacts to Abbott's booby's (*Papasula abbotti*) nesting habitat
- a risk of injury / mortality to native fauna during clearing operations, including the robber crab (*Birgus latro*), red crab (*Gecarcoidea natalis*) and threatened giant gecko (*Cyrtodactylus sadleiri*)
- potential impacts to threatened flora species *Tectaria devexa* var. minor
- the potential introduction and/or spread of weeds into the Christmas Island National Park and areas of primary rainforest which provide high quality fauna habitat.

The Delegated Officer has considered the available supporting information, the applicant's minimisation and mitigation measures (see Section 3.1), that the proposed amendment would not result in additional clearing to that originally approved, the extent of proposed impact, and the consistency of the project with the current mining lease over the application area.

Based on the above information, the Delegated Officer determined that on balance it was appropriate to grant the amended clearing permit subject to contemporised management conditions which align with current practice. These management conditions will ensure an acceptable environmental outcome is achieved.

The Delegated Officer therefore decided to amend the clearing permit subject to conditions requiring the applicant to:

- avoid, minimise and reduce the impacts and extent of clearing
- clear no more than 30 hectares within 18 months of the amendment being granted, and seek approval from DWER's CEO prior to clearing the remaining areas up to the 173.1 hectares proposed. This will allow DWER to consider island wide giant gecko survey findings (surveys in progress), and manage through conditions (if necessary), any realised significant impacts to individuals from fauna strike associated with the larger clearing
- return areas cleared for stockpile access to natural ground level within six months of clearing within 50 metres of the Christmas Island National Park to facilitate revegetation and limit edge effects
- take hygiene steps to minimise the risk of the introduction and spread of weeds

- undertake weed management activities in accordance with the applicants approved EMP
- demarcate the proposed clearing areas prior to clearing and not clear any primary rainforest
- ensure mining activities commence within six months of clearing, where practicable, to lessen the time that areas are left bare prior to mining, maximising the time over which fauna habitat is available
- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity
- not undertake clearing during night-time hours when many fauna species are more active
- undertake pre-clearance searches within suitable habitat for Abbott's booby nests within 100 metres of the application area, and avoid, with a 50-metre buffer, any Abbott's booby nests identified
- undertake site preparation works to facilitate future timely rehabilitation, where clearing occurs within 100 metres of an Abbott's booby nest, to minimise the risk of long-term edge effects to significant habitat for this species
- engage a fauna spotter to remove (if necessary) and relocate robber crabs from the application area ahead of clearing
- liaise with Parks Australia to implement management measures to minimise red crab mortality, prior to clearing during the red crab migration period
- maintain a minimum avoidance buffer of five metres to the Christmas Island National Park
- undertake a pre-clearance search of suitable habitat for *Tectaria devexa* var. minor, and maintain a minimum avoidance buffer of (unless otherwise approved by the CEO):
    - 10 metres to all known locations
    - 50 metres to known locations where the vegetation proposed for clearing is contiguous with the vegetation comprising *Tectaria devexa* var. minor.

1.5. Site maps

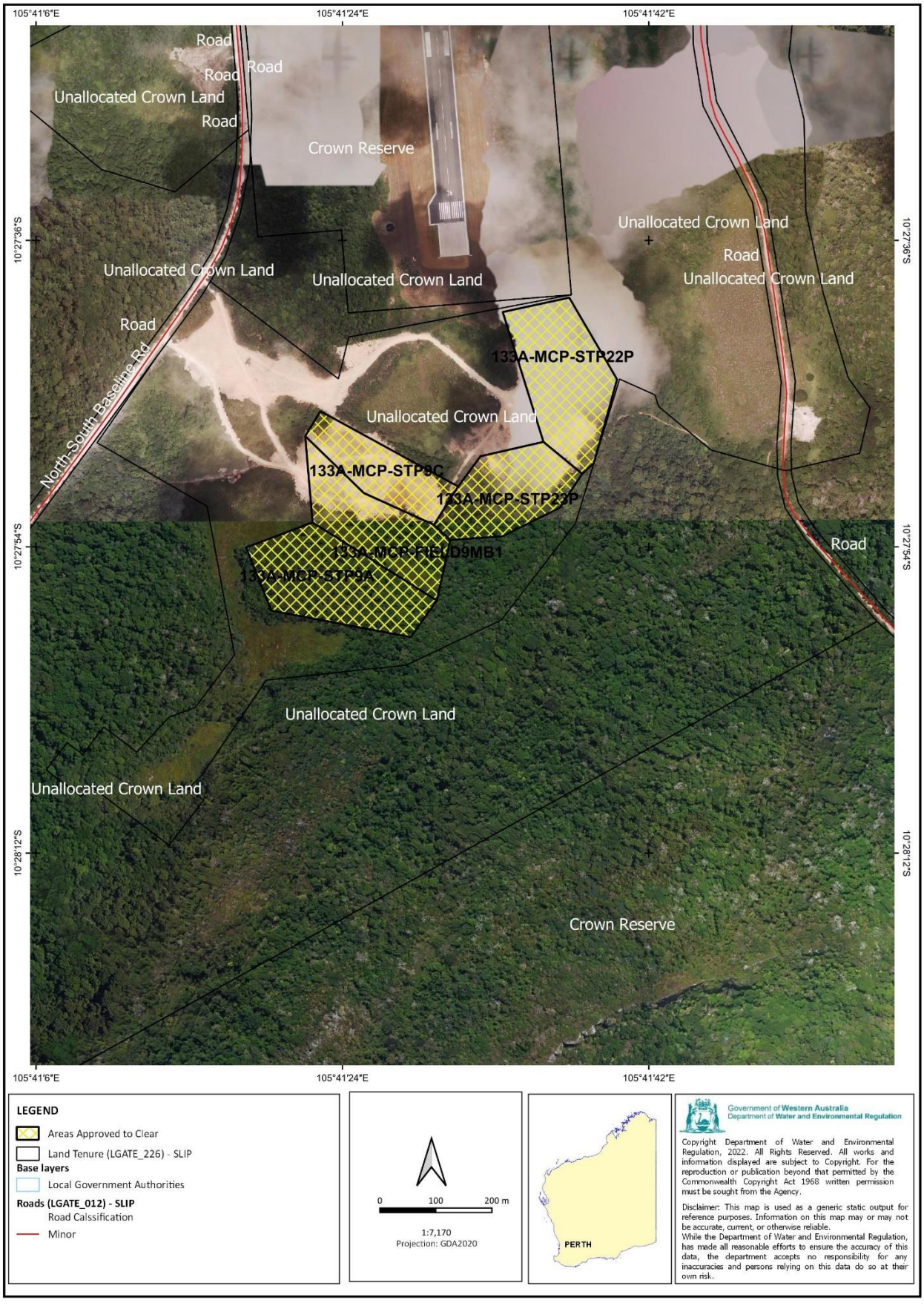

Figure 1. Map of the northern areas applied to clear.

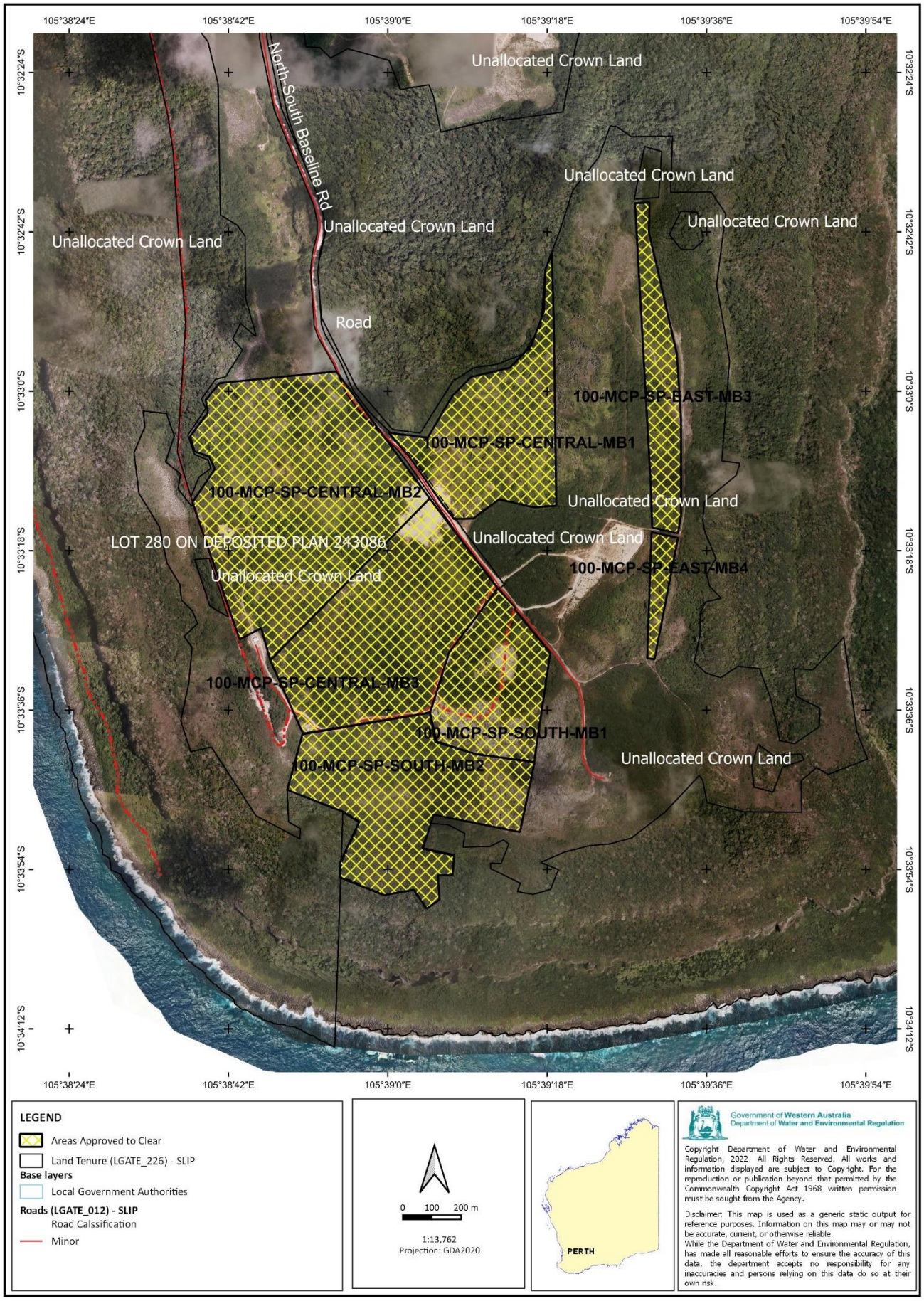

Figure 2. Map of the southern areas applied to clear.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include the:

- *Mining Act 1978*
- *Environment Protection (Impact of Proposals) Act 1974*
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, 2013)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020).

3 Detailed assessment of application

3.1. Avoidance, minimisation and mitigation measures

The applicant has advised that the following avoidance and minimisation measures will be undertaken (CIP, 2024):

- avoidance of all primary rainforest
- demarcate the application areas prior to clearing to ensure no clearing beyond the approved clearing boundaries is undertaken
- identify and avoid all Abbotts booby nests (as a commitment of the EMP).

The Delegated Officer has also considered that the rehabilitation of specific mining areas post mining is undertaken as part of the Christmas Island Minesite to Forest Rehabilitation (CIMFR) program. The CIMFR program is funded by a conservation levy paid by the applicant to the Territory Administration as a requirement of its mining lease. The CIMFR program is managed by Parks Australia under a Memorandum of Understanding between the Director of National Parks and the Territory administration.

The conservation levy is paid by the applicant on all lease areas. The applicant must pay the conservation levy quarterly to the Commonwealth. These funds are used to rehabilitate high priority mined areas, and undertaking other high priority conservation activities on Christmas Island, as largely determined by Parks Australia. Under the mining lease, the applicant is also required to maintain a relinquishment schedule, which sets out the sites to be relinquished to the Commonwealth. Parks Australia then prioritise the most strategic relinquished areas for rehabilitation.

The Delegated Officer is satisfied that the applicant has made an adequate effort to avoid, minimise and mitigate potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

A review of current environmental information (Appendix A) has revealed that the assessment against the clearing principles has, to an extent, changed from the previous CPS 3290 clearing permit decision reports. Specifically, the assessment against clearing principle (b) (fauna values), clearing principle (c) (threatened flora), and clearing principle (h) (conservation areas) has changed. A detailed assessment against these clearing principles is provided below.

Furthermore, an updated summary against the clearing principles is provided in Appendix B noting the time since the previous assessment was undertaken.

3.2.1. Biological values (Fauna) - Clearing Principle (b)

Assessment

The application areas have been subject to a reconnaissance survey (the survey) in 2024 by Christmas Island Environmental Services, which included ground truthing to identify vegetation condition, vegetation type and the presence of native fauna, including the presence of Abbott's booby nests and other native fauna within and nearby the application areas (CIP, 2024).

The survey identified that the application areas largely comprise the following vegetation types (CIP, 2024):

- Bare ground which has been historically cleared (about 21%)
- Weed dominated vegetation and pioneer regrowth (about 53%):
  - a mix of native and weed species with tree height less than 5 metres. Native species commonly include *Macaranga tanarius* shrubland / woodland. These areas typically contain a higher density of weeds than the well-developed regrowth referred to below;
  - monoculture of weed species *Leucaena leucocephala,* often occurring as regrowth in previously cleared areas; and
  - expanse of low-lying ferns often growing on limestone pinnacles.
- Areas of secondary well-developed regrowth of more than 5 metres high which may form open / closed forest and may include weed species (about 26%).

The condition of the vegetation in the application area ranges from very good (area 133A-MCP-STP9A – 3.99 hectares) to completely degraded, with the majority in a good to completely degraded condition (CIP, 2024). The highest value fauna habitat within the application areas includes secondary well-developed regrowth in good or better condition (CIP, 2024). The vegetation condition for each of the areas under application is shown in Appendix A.

The survey included a likelihood of occurrence fauna assessment and identified that 9 conservation significant fauna species have the potential to occur in the application area (see Appendix A.2) (CIP, 2024). DWER's desktop assessment concurred with these findings.

The survey considered that the species at greatest risk of impact from the proposed clearing is the red crab (*Gecarcoidea natalis*) (keystone species – not conservation listed) (CIP, 2024). DWER also considers that the Abbott's booby (*Papasula abbotti*) (Endangered; EPBC Act), coconut crab (*Birgus latro*) (not conservation listed) and giant gecko (*Cyrtodactylus sadleiri*) (Endangered; EPBC Act) may be at risk of impact from the proposed clearing.

Regarding the applicants request to remove a Christmas Island pipistrelle (*Pipistrellus murrayi*) management condition from the previous clearing permit, DWER has considered that this species was declared extinct in 2021. Therefore, potential impacts to this species have not been discussed further below, and it is considered appropriate to remove the previous management condition that relates to this species. The cause of the extinction of this species is not completely known, however predation by introduced species and disease have been suggested as the most likely contributing factors.

<u>Abbott's booby</u>

Background - ecology, critical habitat, key threats

Abbott's booby only known extant nesting colony is on Christmas Island. This species nesting habitat is widely distributed in tall, forested areas of the plateau and in upper terrace forests (Commonwealth of Australia, 2020). Abbott's booby prefers nest sites on the lee side of slopes and gullies, with a clear area below and immediately downwind to facilitate take-off and landing (DEH, 2004). About 83% of known nesting habitat occurs within the primary rainforest in Christmas Island National Park (Commonwealth of Australia, 2020).

Abbott's Booby must fly into the wind to land and mostly nests on the north-west side of trees in parts of the island offering shelter from the prevailing southeast trade winds (Commonwealth of Australia, 2020). A variety of tree species are used for nesting, most often open-crowned *Syzygium nervosum* and *Planchonella nitida*, and *Tristiropsis acutangula* and *Celtis timorensis* where they become emergent (Commonwealth of Australia, 2020). Emergent trees are those trees that are taller than the main canopy and can reach heights of 50 metres on Christmas Island.

Abbott's booby forages on fish species over the ocean surrounding Christmas Island, although its foraging range is poorly known (Commonwealth of Australia, 2020).

Critical habitat for Abbott's booby includes all known nesting trees, and all forest vegetation with a 200-metre radius of known nesting trees (Commonwealth of Australia, 2020). The inclusion of forest vegetation within 200 metres of a known nesting tree as critical habitat is to protect nests from indirect impacts and other nearby emergent trees that may become nest trees in the future (Commonwealth of Australia, 2020). Known nesting trees are trees that are currently used for nesting, or have previously been used for nesting, where they are still standing (Commonwealth of Australia, 2020).

Forest vegetation within 100 metres of critical habitat is also important, noting that clearing vegetation within 300 metres of a nest may cause breeding pairs to abandon nests due to increased wind turbulence from strong southeast trade winds (Commonwealth of Australia, 2020). Forest vegetation is not defined in the Abbott's Booby Conservation Advice (the advice).

Forest vegetation with suitable emergent nesting trees with no evidence of nesting are also important to the recovery of this species (Commonwealth of Australia, 2020). These areas are considered potential critical habitat (Commonwealth of Australia, 2020). The advice states that clearing of critical habitat and potential critical habitat should be avoided and mitigated to the greatest extent possible (Commonwealth of Australia, 2020).

Key threats to the Abbott's booby include the modification and destruction of nesting habitat from new vegetation clearing and edge effects to critical habitat from clearing (DEH, 2004).

Nesting habitat – direct impacts

No nesting trees were identified within or adjacent to the application areas during the survey (CIP, 2024). Based on available datasets, no nesting trees have previously been recorded in the application areas.

Based on the ground truthing reconnaissance survey, forest habitat comprising taller secondary regrowth (20 to 28 metres) occurs within portions of application areas 100-MCP-SP-CENTRAL-MB2, 100-MCP-SP-CENTRAL-MB3, and 133A-MCP-STP9A. This includes *Syzygium nervosum, Planchonella nitida* and *Tristiropsis acutangula* trees (CIP, 2024). Based on the canopy heights recorded, these areas are not likely to comprise emergent rainforest trees that provide current nest habitat, however, may provide nest habitat in the future.

There are five historical Abbotts booby nest records within 300 metres of the application areas:

- Nests 1 and 2 (2011 records) – 140 metres and 220 metres from the 100-MCP-SP-SOUTH-MB2 application area respectively (excluding the area relinquished for rehabilitation)
- Nest 3 (2011 record) – 80 metres from the 100-MCP-SP-EAST-MB3 application area
- Nest 4 (2015 record) – 180 metres from the 133A-MCP-STP9A application area
- Nest 5 (2015 record) – 150 metres from the 133A-MCP-STP23P application area (now cleared), 210 metres from the 133A-MCP-FIELD9MB1 application area, 220 metres from the 133A-MCP-STP22P and 133A-MCP-STP9A application areas, and 260 metres from the 133A-MCP-STP9C application area.

While the above records are historical and not recently ground truthed, without additional information to confirm otherwise, it is presumed that these records are still being used for nesting, given the species exhibits nest site fidelity (Commonwealth of Australia, 2020). Therefore, the forest habitat in the application areas that occurs within 200 metres of these nesting records aligns with the description of Abbott's booby critical habitat. These areas comprise 45.08 hectares (excluding recently cleared areas under the previous amendment).

Except for the 133A-MCP-STP9A application area, the remaining application areas mentioned above are in a degraded to completely degraded condition and contain low density regrowth vegetation, with canopy heights lower than 18 metres (CIP, 2024). Therefore, the extent of impact to critical habitat ('forest vegetation') is expected to be small. The Delegated Officer therefore determined that the proposed impact is not a significant residual impact in this instance. In making this determination the Delegated Officer also considered the site context, lack of current nesting use observed within or adjacent to the application areas (CIP, 2024), and extent of high value nesting habitat protected within Christmas Island National Park (8,505 hectares), where most known nesting habitat occurs.

The Delegated Officer also considered the cumulative impact of clearing regrowth rainforest for phosphate mining on this species resulting from several approved and applied for Christmas Island Phosphate clearing permit

applications (mostly amendments). While the cumulative impacts are not at a level that would warrant a decision to allow no further clearing within the current mining lease areas, the Delegated Officer considers that the loss of potential Abbott's booby nesting habitat must be appropriately managed through conditions on the clearing permit to ensure an acceptable environmental outcome. These conditions are detailed below within Section 3.2.1 under 'Conditions'.

In making this determination, the Delegated Officer had regard for the revegetation actions undertaken by Parks Australia within high priority relinquished mining areas, using funds paid into a conservation levy by the applicant. These actions would have the effect of reinstating native vegetation nearby Abbott's booby nest sites, to mitigate the long-term impacts to this species habitat. More information on revegetation actions is discussed under 'Nesting habitat – indirect impacts' below.

Nesting habitat - indirect impacts

Regarding the potential impact of wind turbulence on nest sites, strong southeasterly trade winds prevail between April and November on Christmas Island. Wind tunnel experiments indicate that clearing forest increases turbulence in the surrounding canopy, which may lower fidelity, and increase adult mortality of Abbott's booby (Commonwealth of Australia, 2020).

Studies indicate that birds nesting within 300 metres downwind of areas cleared for mining activities had lower breeding success and increased mortality due to greater wind turbulence (Commonwealth of Australia, 2020). The Abbott's Booby Conservation Advice notes that the indirect impact of clearing within 300 metres of a nest site depends on the aspect of the site, nature of vegetation to be cleared and number of nest trees to be protected (Commonwealth of Australia, 2020).

The greatest risk of impact to nest sites from wind turbulence is from clearing upwind (based on southeasterly trade winds) of a nest site. There are no application areas within 300 metres and upwind of a previously recorded nest site, excluding the relinquished area proposed for rehabilitation. Therefore, it is unlikely that the proposed clearing will significantly impact on nesting Abbott's booby through increased wind turbulence.

There is also a risk that clearing native vegetation nearby nest sites may (Commonwealth of Australia, 2020):

- cause edge effects to adjacent primary rainforest containing nest sites; and
- cause high levels of noise which may lead to birds abandoning nests, leaving chicks or eggs exposed to predation.

The advice specifies that edge effects caused by clearing are a key reason for the decline of this species (Commonwealth of Australia, 2020). The advice notes that clearing of forest vegetation adjacent to nesting habitat reduces the habitat suitability of adjacent areas due to higher light levels changing its floristic structure, changes in localised humidity levels, weed incursion and pest species establishment (Commonwealth of Australia, 2020).

Given the above, there is a risk that the proposed clearing will result in edge effects to Abbott's booby nest habitat. This is considering the proximity of historical nest sites and the potential for new nest sites to have been occupied nearby the application areas, which are not yet known. Therefore, management measures are required to protect Abbotts booby nest habitat nearby the application areas from edge effects and noise impacts.

Avoidance, mitigation and management

The applicant has committed to identifying Abbott's booby nest sites within and nearby the application areas prior to clearing, and maintain a 50-metre avoidance buffer to all Abbott's booby nest sites. This commitment is considered adequate to minimise the risk of noise impacts to Abbott's booby nesting activity, and nesting habitat, respectively.

The Delegated Officer acknowledges that the applicant pays a conservation levy as required by its mining lease, to fund the rehabilitation of specific relinquished areas post mining by Parks Australia. Revegetation nearby Abbott's booby nest sites is considered a high priority by Parks Australia. The successful rehabilitation of mined areas post mining near Abbotts booby nest sites, would assist to reinstate Abbotts booby nest habitat, and minimise long-term edge effects (as noted above) to nesting habitat through re-instating primary rainforest structure, natural light and humidity levels and preventing significant weed incursion.

Parks Australia provided comment on the proposed clearing and advised that the most important factors for successful rehabilitation of mined areas on Christmas Island include:

- the maintenance of at least one meter of topsoil above the pinnacle post mining; and

- the availability of recently cleared vegetative material for re-spread.

Parks Australia advised that one metre of topsoil above the pinnacle is not typically present on relinquished areas, which has led to difficulties in successfully and efficiently rehabilitating priority areas, including areas nearby Abbotts booby nest sites. Parks Australia note that while the applicant is required to make a certain volume of topsoil available through the mining lease, topsoil availability nearby high priority rehabilitation areas is often limited, which impacts on successful and timely rehabilitation.

Based on Parks Australia's advice, the Delegated Officer considers it appropriate to require the applicant to maintain one metre of soil profile above the pinnacle, and make cleared vegetative material available post mining, for any areas cleared within 100 metres of Abbotts booby nest sites. This requirement will help to facilitate timely rehabilitation by Parks Australia nearby Abbotts booby nest sites, once sites are relinquished to the Commonwealth (see Section 3.1). This is considered an important measure to manage the long-term risk of edge effects to Abbott's booby nesting habitat from clearing, reinstate potential future Abbotts booby nesting habitat, and minimise the risk of future decline of this species population on Christmas Island.

The Delegated Officer considers that the above requirements are site preparation actions to facilitate future rehabilitation, as a specific management action for a threatened species, rather than rehabilitation actions in and of themselves.

Subject to appropriate management conditions as discussed above, the proposed clearing is not likely to impact on nesting individuals or substantially reduce the extent of critical habitat or potential critical habitat for this species.

Red crab

Red crabs are a keystone species on Christmas Island, responsible for maintaining the structure and composition of the island's rainforest. Red crabs are common in the moist environment of the rainforest, however, inhabit a variety of other habitats, including areas of primary and secondary regrowth (Director of National Parks 2015).

Red crabs were identified within application area 133A-MCP-STP9A, and it is likely that they occur within other application areas, at least transiently (CIP, 2024). Based on mapped crab burrow densities across Christmas Island, the application areas are not in areas of high red crab burrow density.

At the beginning of the wet season (October to December) adult red crabs migrate from the forest to the coast to breed and spawn (Director of National Parks 2015). An island wide study of red crab migration routes was previously undertaken to identify the most strategic locations for red crab migration fencing and infrastructure points. Based on that study, and burrow densities, the application areas are unlikely to occur along important red crab migration routes.

Noting the above, the proposed clearing is not likely to impact on significant habitat for this species, or impact on its future breeding success. However, the proposed clearing will impact on individual red crabs using the application area at the time of clearing and may lead to an increase in red crab mortality during its migration period. The applicant has committed to liaising with Parks Australia prior to clearing during the red crab migration period to identify measures to minimise crab mortality.

The applicant has also committed to undertake the following red crab management measures within its EMP, which must be complied with under the conditions of its mining lease (PRL, 2017):

- schedule haulage, mining and road maintenance to minimise vehicle traffic on high-risk roads during migration
- incorporate red crab migration into mine planning to determine management methods and strategies
- assess red crab densities in proposed clearing areas and where very high densities occur consider options to minimise mortality through amending boundaries of the clearing envelope and/or clearing high density areas after red crabs leave burrows for migration
- continue red crab management and awareness training of staff including promoting awareness and encouraging the sharing of vehicles to and from work and using red crab 'friendly' routes to minimise road mortality
- monitor vehicle usage and red crab mortality during migration periods to assess vehicle restriction effectiveness
- subject to capacity and resources, work with island partners to assist in the implementation of island-wide conservation and environmental management programs.

Robber crab

Robber Crabs are found on most parts of Christmas Island, from the shore terrace to the highest plateau areas. Robber Crabs are habitat generalists, and all areas of previously uncleared rainforest are considered high quality habitat for this species (Director of National Parks, 2014).

This species was not recorded in the application areas during the survey (CIP, 2024). Given the extent of higher quality habitat that exists for this species within surrounding areas of primary rainforest in Christmas Island National Park, the habitat within the application areas is not considered significant for this species.

There is however the risk of robber crab mortality from fauna strike during clearing operations, should they be using the application areas at the time of clearing. Measures to remove and relocate robber crabs from the application areas prior to and during clearing will assist to minimise this risk.

The applicants EMP, which is required to be complied with under the conditions of the mining lease, includes the following commitments which will assist in minimising fauna strike with robber crabs (PRL, 2017):

- remove and relocate Robber Crabs prior to clearing vegetation as required
- minimise vehicle-based mortality through employee education programs.

Giant gecko

The giant gecko is endemic to Christmas Island. This species is found in all Island habitats, except for areas lacking trees and shrubs. Evergreen tall, closed primary forest on the plateau is considered the most important habitat for this species and is where the highest density of occurrence has been recorded (Director of National Parks, 2015; Commonwealth of Australia, 2013a). The survey did not identify this species within the application areas (CIP, 2024), however this species is nocturnal and was not likely visible during the time of survey.

The Giant Gecko Conservation Advice indicates that habitat loss has been a significant threat to this species in the past, however currently this is considered a potential future threat rather than a current threat given the protections in place to preserve the remaining primary forest areas in the Christmas Island National Park (Commonwealth of Australia, 2013a).

Based on available datasets informed by island wide surveys undertaken by Parks Australia in 2013 and 2015, the application areas are not within any previously known giant gecko locations.

The application areas largely comprise low to medium density regrowth in a good to completely degraded condition. This modified habitat is unlikely to be significant for this species noting the extent of higher quality habitat, comprising a greater density of recorded individuals, within the closed primary forest of Christmas Island National Park (around 8,505 hectares).

Noting that this species is found in all habitat types on Christmas Island, the proposed clearing may impact on this species through fauna strike should it be using the application area during clearing.

The applicant has commissioned biological surveys for this species across several locations on Christmas Island to better inform its population numbers and status on Christmas Island. This survey work will help to identify the likely extent of occurrence of this species within the application areas, and whether targeted management is required to reduce the risk of fauna strike. The reports associated with these surveys are yet to be finalised.

To allow the findings of the surveys to be realised, the Delegated Officer has determined in this instance it is appropriate to condition the permit to allow a reduced clearing extent (30 hectares) over the first 18 months of this amendment. The Delegated Officer considers that the impact to individuals of this species from the initial clearing of 30 hectares is unlikely to be significant, based on the current knowledge of this species highest density habitat and known locations. After 18 months, the applicant will have the option of seeking approval from DWER's CEO to clear to the full extent proposed (173.1 hectares), subject to providing the findings of the giant gecko surveys. This will allow DWER to impose appropriate, well informed management conditions as required, should the survey findings indicate that a substantial impact to giant geckos would occur through clearing the larger area proposed.

The Delegated Officer notes that the applicant is also required to obtain a section 13 permit under the EPBC Act to kill, injure or take threatened flora listed under the EPBC Act.

Christmas Island flying fox (*Pteropus melanotus natalis*)

This mammal is endemic to Christmas Island and listed as Critically Endangered under the EPBC Act. It roosts on the island's coastal terraces or close to the first inland cliff in semi-deciduous forest with varying structural features

(Todd, 2019). The roosts are very close to the coast, thought to allow this species to use onshore winds to facilitate take-off (Commonwealth of Australia, 2013). *Pteropus* species show high fidelity to roosts (Todd, 2019).

This species forages across the island, feeding on the fruits and flowers of more than 30 different plant species, from rainforests, gardens, and post-mine revegetation sites (where this contains trees and shrubs). The species is thought to have a relatively large foraging range of more than 6 kilometres from roosts (Todd, 2019).

The survey did not identify any evidence of roosting by the above species within or adjacent to the application areas (CIP, 2024). Noting this, and that the application areas proposed for mining under this application are set back from the coastal terraces, and do not include any known roosts (Todd, 2019), the proposed clearing is not likely to impact on roosting individuals or significant roosting habitat.

While the proposed clearing will impact on suitable foraging habitat for this species, this impact is not likely to be significant given the extent of foraging habitat within the surrounding primary rainforest, much of which is within Christmas Island National Park.

The undertaking of slow, one directional clearing would help to minimise the risk of fauna strike to this species should it be foraging within the application areas at the time of clearing.

Other Species

The application areas may also include suitable habitat for the below threatened bird species:

- Christmas Island emerald dove (*Chalcophaps indica natalis*) (EN; EPBC Act)
- Christmas Island goshawk (*Accipiter hiogaster natalis*) (EN; EPBC Act)
- Christmas Island hawk-owl (*Ninox natalis*) (Vulnerable); EPBC Act)
- Christmas Island thrush (*Turdus poliocephalus erythropleurus*) (EN; EPBC Act)
- golden bosunbird (*Phaethon lepturus fulvus*) (EN; EPBC Act).

The survey did not identify any evidence of nesting by the above species within or adjacent to the application areas (CIP, 2024). The Delegated Officer considers that the application areas are unlikely to provide significant habitat for these species, and that there is a low risk of the above species using the application areas for nesting or roosting. This is noting the type and condition of the vegetation under application, known ecology of the above species (Commonwealth of Australia 2013, 2014, 2014a, 2016, 2016a), survey findings, and availability of nesting habitat with nearby primary rainforest and surrounds. Regarding the availability of suitable nesting habitat, Christmas Island is 75% vegetated (comprising 10,125 hectares) of which 84% (8,505 hectares) occurs in Christmas Island National Park.

The above species are highly mobile and are unlikely to be at risk of fauna strike, noting the low risk of nesting birds within the application area and that slow progressive one directional clearing is proposed.

In the unlikely event of any nesting threatened birds using the application areas at the time of clearing, the Delegated Officer had regard for the applicants requirement to obtain a permit under Section 13 of the EPBC Act (which may be subject to specific conditions as appropriate) to kill, injure or take EPBC Act listed threatened species.

Conclusion

The proposed clearing will impact on critical habitat for Abbott's booby, noting it occurs within 200 metres of previously recorded Abbott's booby nest sites. The Delegated Officer considers that the expected extent of impact to critical habitat for Abbott's booby under this proposed amendment is not a significant residual impact. This is noting the vegetation type, condition and density of the application areas, site context, the lack of current nesting use observed within or adjacent to the application areas (CIP, 2024), and extent of high value nesting habitat protected within Christmas Island National Park where most known nesting habitat occurs.

The Delegated Officer also had regard to the conservation levy which the applicant is required to pay into under its mining lease, used to fund the revegetation of high priority areas relinquished by the applicant post mining. The revegetation is coordinated through the CIMFR Program (See section 3.1). High priority areas include areas closest to Abbott's booby nest sites.

The proposed clearing has the potential to indirectly impact on nesting Abbotts booby individuals and nesting habitat through noise and edge effects, respectively. Management actions are required to address this impact (see below).

The application areas also provide suitable habitat for other conservation listed fauna. However, this habitat is not considered significant noting:

- the application areas have been historically cleared, are largely in a good to completely degraded condition, and do not contain primary rainforest
- the application areas comprise around 1.7% of the total vegetated area of Christmas Island, much of which is protected within Christmas Island National Park and comprises higher quality fauna habitat in the form of primary and secondary forest
- no conservation listed fauna were identified within the application areas during the survey (CIP, 2024)

The proposed clearing may impact on conservation significant fauna through fauna strike, should these species be using the application areas at the time of clearing. Species most at risk of fauna strike are the red crab (particularly during its migration period), robber crab, giant gecko, and to a lesser extent, Abbott's booby.

Noting the above, management actions are required to address the impact to these fauna species as specified below.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- undertake pre-clearance searches for Abbott's booby nests, in suitable habitat within 100 metres of the application area, and maintain a 50-metre avoidance buffer around any Abbott's booby nests identified
- undertake site preparation works to facilitate timely future revegetation where clearing occurs within 100 metres of an Abbott's booby nest, to minimise the long-term risk of edge effects
- clear no more than 30 hectares within 18 months of the amendment being granted and seek approval from DWER's CEO prior to clearing the remaining areas up to the 173.1 hectares proposed. This will allow DWER to consider island wide giant gecko survey findings (surveys in progress), and manage through conditions (if necessary), any realised significant impacts to individuals from fauna strike associated with the larger clearing
- engage a fauna spotter to remove (if necessary) and relocate robber crabs from the application area ahead of clearing
- undertake slow progressive one directional clearing to allow fauna to disperse ahead of clearing
- not undertake clearing during night-time hours
- undertake weed management activities in accordance with the applicants approved EMP
- demarcate the proposed clearing areas prior to clearing and not clear any primary rainforest
- return areas cleared for stockpile access to natural ground level within six months of clearing within 50 metres of the Christmas Island National Park to facilitate revegetation and limit edge effects
- liaise with Parks Australia to implement management measures to minimise crab mortality, prior to clearing during the red crab migration period.

3.2.2. Conservation Areas - Clearing Principle (h)

Assessment

Christmas Island National Park covers about 64 per cent of Christmas Island and part of the islands marine zone. The National Park was established to conserve the primary rainforest on Christmas Island, endemic flora and fauna, nesting colonies of seabirds, land crab populations, fringing coral reefs, significant cave systems and Ramsar wetlands (Director of National Parks, 2014).

Potential threats to the terrestrial vegetation within the National Park include the risk of new invasive species arriving and establishing on the island, and the spread of existing shade tolerant weed species spreading into the National Park (Director of National Parks, 2014).

The application areas are confined to the Mining Lease boundary which do not include areas of National Park. However, the 100-MCP-SP-SOUTH-MB2 and 100-MCP-SP-CENTRAL-MB2 application areas are within 10 metres

of the National Park. No other application areas are within 50 metres of the National Park. While the proposed clearing will not directly impact on vegetation within the National Park, it may result in the introduction and spread of weeds into these areas without appropriate management.

The applicant has committed to maintaining a minimum 5-metre buffer around the National Park (CIP, 2014). The applicant has advised that the buffer would protect up to the drip line beneath adjacent canopy trees and prevents root damage or compaction of bordering vegetation (Range to Reef, 2014).

Additional information provided to support a previous CIP clearing permit application (being CPS 6323/1) noted that the above 5-metre buffer is adequate to minimise direct and indirect impacts to the National Park as weeds on Christmas Island struggle to proliferate within the primary rainforest due to low light and consumption by red crabs (Range to Reef, 2014). Potential weeds of intact rainforest must possess two key traits: the ability to establish and grow under heavy shade, and the ability of both seeds and seedlings to tolerate, evade, or resist consumption by red crabs (Green et al., 2003). Most weeds on Christmas Island do not have these key traits (i.e *Leucaena* and Jamaican cherry). There are however some shade tolerant weed species which require appropriate management. This is reflected in the Christmas Island National Park Management Plan which states that most introduced flora species have not invaded undisturbed rainforest vegetation, except for *Clausena excavata*, *Delonix regia* and *Aleurites moluccana* (Director of National Parks, 2015).

The applicant also maintains a maximum 30-degree gradient to the edge of mined areas, which prevents an abrupt vertical cut-off at the edge of the mining areas adjacent to native vegetation.

The applicant has committed to weed management measures as set out in its EMP, which it is required to comply with under its mining lease. These measures include (PRL, 2017):

- undertake a program of weed control on priority weed species
- undertake annual weed monitoring of areas disturbed by the applicant
- maintain a record of priority weed species and locations identified in the applicant's mining tenement
- develop an annual program of weed monitoring and control
- maintain a weed management schedule for priority weed species and priority weed infestation areas
- maintain a record of weed monitoring and control activities
- work collaboratively with Parks Australia to address weed management of other introduced flora species adjacent to National Park if adequate resources are available.

The Delegated Officer therefore considered that a 5-metre buffer to the National Park was appropriate in this instance, noting:

- many weeds on Christmas Island cannot survive in primary rainforest due to low light and consumption by crabs, except for shade tolerant weed species which can be appropriately managed
- weed management measures will be required as a condition of the permit
- the applicant maintains a maximum gradient of 30 degrees to the mining area edge
- the existing degraded condition of the 100-MCP-SP-SOUTH-MB2 and 100-MCP-SP-CENTRAL-MB2 application areas which do little to buffer weed ingress in their current state.

Conclusion

The proposed clearing will not directly impact on vegetation within the National Park, however it may result in the introduction and spread of weeds into the National Park if the below appropriate management measures are not adhered to.

Conditions

To address the potential risk of weed spread into the National Park, the following management measures will be required as conditions on the clearing permit:

- maintain a minimum five metre buffer to Christmas Island National Park
- undertake weed hygiene measures for machinery entering and leaving the proposed clearing areas
- undertake weed management activities in accordance with the specified weed management commitments set out in the EMP.

3.2.3. Threatened flora - Clearing Principle (c)

Three threatened flora species (under the EPBC Act) are known to occur on Christmas Island:

- *Asplenium listeri* (Christmas Island Spleenwort) (critically endangered) – occurs in limestone rock crevices in dry exposed areas. Habitat critical to this species includes all limestone rock crevices nearby known occurrences and taller vegetation on the island side of cliff-top sites.
- *Pneumatopteris truncata* (Christmas Island fern) (critically endangered) – is known from only two localities on the southwest side of the island where it occurs on permanently moist sites associated with groundwater seepage in semi-deciduous closed forest.
- *Tectaria devexa var. minor* (cave fern) (endangered) – occurs mainly on the plateau in primary rainforest (tall and largely undisturbed) above 80 metres elevation. Habitat critical to this species survival is considered to include all areas within 50 metres of the area occupied by the species.

(Butz, 2004; Butz, 2004a; CIP, 2024; Commonwealth of Australia 2014b).

The closest known threatened flora record to the application area is *Tectaria devexa* var. minor, with six records located between 17 and 45 metres from the 100-MCP-SP-CENTRAL-MB2 application area. These records occur on the opposite side of North-South Baseline road within primary rainforest, with the road segregating the vegetation within the application area from the patch with the recorded *Tectaria devexa* var. minor.

The above *Tectaria devexa* var. minor records are also around 92 to 145 metres from the 100-MCP-SPCENTRAL-MB1 application area, and the vegetation they occur within is contiguous with this application area. However, this area was recorded as being in a completely degraded condition (CIP, 2014) and does not provide suitable habitat for this species. None of the other application areas occur within 100 metres of known records of this species.

The reconnaissance survey undertaken by Christmas Island Environmental Services (CIP, 2024), did not identify any of the above threatened flora species.

Noting the known locations of *Tectaria devexa* var. minor were recorded in primary rainforest on the opposite side of the North-South Baseline road to the 100-MCP-SP-CENTRAL-MB2 application area, and more than 90 metres from the completely degraded 100-MCP-SPCENTRAL-MB1 application area, the proposed clearing of these areas is unlikely to impact (either directly or indirectly) these known occurrences.

However, there is some potential for this species to occur in the 100-MCP-SP-CENTRAL-MB2 application area, given the proximity of this area to known records and that this area includes some medium density regrowth in a good condition (CIP, 2024).

Measures requiring a pre-clearance search for this species within suitable habitat in the above application area, and avoidance with a 10-metre minimum buffer if found, and a 50-metre buffer if found within vegetation contiguous with the application area, would assist in minimising the risk of impact to this species.

The application areas do not provide suitable habitat for *Pneumatopteris truncata* and *Asplenium listeri* (CIP, 2024), and neither species has been recorded within 200 metres of the application areas. Predictive distribution mapping also indicates that these species are unlikely to occur within the application areas. Noting this, the proposed clearing is unlikely to impact on these species. It is acknowledged that the previous clearing permit, being CPS 3290/3, included a condition to require minimum avoidance buffers to occurrences of these species. However, given the above, the Delegated Officer considered it unnecessary to reinstate this conditional requirement.

Conclusion

The proposed clearing of the 100-MCP-SPCENTRAL-MB2 area may impact on suitable habitat for *Tectaria devexa* var. minor. Therefore, management actions are required to address potential impacts to this species. The proposed clearing is not likely to impact on *Asplenium listeri* or *Pneumatopteris truncata*.

Conditions

To address the above impacts, the following management actions will be required as a condition on the permit:

- undertake a pre-clearance search of suitable habitat within the 100-MCP-SPCENTRAL-MB2 application area for *Tectaria devexa* var. minor, and maintain a minimum avoidance buffer of (unless otherwise approved by the CEO):
    - 10 metres to all known locations

- 50 metres to known locations where the vegetation proposed for clearing is contiguous with the vegetation comprising *Tectaria devexa* var. minor.

3.3. Relevant planning instruments and other matters

The applicant operates phosphate mining, processing and shipping operations from Christmas Island over approximately 1636 hectares of the island (CIP, 2024). The applicant was issued a Mining Lease (MCI 70/1A) on 4 August 1997, under the *Mining Act 1978* (WA). In 2013, the lease was extended until 2034.

All applications areas are contained within the approved mining lease, except for the southern portion of the 100-MCP-SP-SOUTH-MB2 application area, which has now been relinquished to the Commonwealth for rehabilitation by Parks Australia. This area has been included in the current amendment application at the request of the Parks Australia (as agreed to by the applicant) to allow potential future clearing to access topsoil for rehabilitation works.

The EPBC Act applies on Christmas Island. Mining was approved within MCI 70/1A in 1997 under the former *Environment Protection (Impact of Proposals) Act 1974*.

Under conditions of the mining lease, no primary rainforest can be cleared for mining operations and the applicant must comply with the requirements of its Commonwealth approved Environmental Management Plan (EMP) (2018 – 2023) (PRL, 2017). The applicant notes that the 2024 to 2029 management plan is in the process of being formalised, for approval by the Commonwealth.

The EMP sets out that the applicant will undertake the following management actions for mining areas (amongst others):

- undertake mine site planning (i.e. an Erosion Control Plan) for all clearing operations to identify potential erosion potential and mitigation strategies
- realign exploration tracks and install temporary drainage systems to minimise erosion potential by directing stormwater into appropriate off-site locations
- implement mitigation measures as appropriate to minimise erosion which may include:
  - diversion of flow into pinnacle or natural areas as feasible to prevent sediment transport and erosion
  - use of vegetative buffer zones in mine areas
  - loosening of compacted soil prior to leaving site
  - construction of earth dykes (bund drains) and earth swales (v drains) for onsite water conveyance
  - construction of erosion works to retain stormwater on site longer and to reduce sediment content and erosion potential of water leaving site
  - continuous monitoring and maintenance of on-site drainage and erosion works
  - containing all runoff from ROM pads in sediment control structures
  - monitor cleared areas, with review of runoff and erosion pattern, in accordance with the erosion monitoring procedure, and identify and implement remedial works as required
  - investigate opportunities for topsoil retention in use on mine sites.

Under the mining lease the applicant must also:

- implement a dust suppression program
- maintain stockpile access of a certain volume to Park Australia for its rehabilitation works
- prepare a relinquishment schedule for Commonwealth approval, for relinquishment of mined areas post mining
- make safe all areas mined, to the satisfaction of the Department of Mines, Petroleum and Exploration
- pay a conservation levy to the Commonwealth to be used for the rehabilitation of high priority relinquished mining lease areas on Christmas Island, and other high priority conservation activities on Christmas Island.

The applicant has a DWER prescribed premises licence issued under Part V of the EP Act, for the control and abatement of pollution from the loading and unloading activities and processing activities (beneficiation of metallic or non-metallic ore) on Christmas Island.

The Shire of Christmas Island was notified of the amendment application and did not provide comment. Local government approvals are not required for the proposed mining operation.

End

Appendix A. Site characteristics

A.1 Site characteristics

Characteristic	Details
Local context	Christmas Island retains approximately 75 per cent native vegetation, of which 84 per cent (64 per cent of total island area) is protected within the Christmas Island National Park. The 173.1 hectares of vegetation proposed for clearing occurs within 12 application areas and is largely surrounded by intact primary rainforest. The application areas have previously been cleared for the purpose of phosphate mining.
Ecological linkage	The application areas do not form part of a known ecological linkage.
Conservation areas	The 100-MCP-SP-CENTRAL-MB2 and 100-MCP-SP-SOUTH-MB2 application areas are within 50 metres of Christmas Island National Park. None of the application areas encroach on the National Park.

Vegetation description	Christmas Island was subject to an island wide vegetation mapping project between 2011 and 2014 (Geoscience Australia, 2014). The project largely mapped the application areas as:
	
	• Fern field – comprising expanse of low-lying ferns (typically *Nephrolepis biserrata)* often growing on limestone pinnacles;
	• Mixed weed and pioneer species – regrowth vegetation with a mean tree height of less than 5 metres, typically containing a higher proportion of weeds than the below 'Regrowth' category; and
	• Regrowth – generally well-developed regrowth over 5 metres mean tree height, which may include weed species.
	
	All areas proposed for clearing have been previously cleared and contain varying extents of regrowth vegetation (CIP, 2024).
	
	The survey identified that the application areas largely comprise the following vegetation types (CIP, 2024):
	• Bare ground which has been historically cleared (about 21%)
	• Weed dominated vegetation and pioneer regrowth (about 53%):
	  ○ a mix of native and weed species with tree height less than 5 metres. Native species commonly include *Macaranga tanarius* shrubland / woodland. These areas typically contain a higher density of weeds than the well-developed regrowth referred to below;
	  ○ monoculture of **Leucaena leucocephala,* often occurring as regrowth in previously cleared areas; and
	  ○ expanse of low-lying ferns often growing on limestone pinnacles.
	• Areas of secondary well-developed regrowth of more than 5 metres high which may form open / closed forest and may include weed species (about 26%).
	
	A summary of the vegetation type based on a ground truthing reconnaissance survey undertaken by Christmas Island Environmental Services in 2023, is shown in Appendix A2 below and publicly available within Table 5 of the 'Supporting Document for Amendment to CPS 3290/3' (labelled 'CPS 3290-4 – Supporting Document') (CIP, 2024).
	
	Recent photographs of the vegetation within the application areas undertaken as part of the reconnaissance survey is publicly available within the document titled 'Appendix I Field Site Photos, Waypoints, and Condition Survey Score' (labelled 'CPS 3290-4 - Supporting Information – Photographs) (CIP, 2024).

Vegetation condition	Photographs and the reconnaissance survey supplied by the applicant (CIP, 2024) indicate that the vegetation within the application areas largely ranges from a completely degraded to very good (Keighery, 1994) condition, with the majority in a good to

Characteristic	Details
	completely degraded condition. The full Keighery (1994) condition rating scale is provided in Appendix C. The specific vegetation condition of each application area based on the reconnaissance survey is shown in Appendix A2 below (CIP, 2024).
Climate and landform	Christmas Island is the summit of a submarine mountain. It rises steeply to a central plateau dominated by stands of rainforest. The plateau reaches heights of up to 361 metres and consists mainly of limestone with layers of volcanic rock. The Island's 80-kilometre coastline is an almost continuous sea cliff, ranging in height to 20 metres. Christmas Island has a tropical monsoonal climate with a distinct wet season occurring from December to April. The average rainfall is around 2,000 millimetres per annum.
Soil description	Christmas Island comprises a layer of phosphate-rich soil covering limestone, often existing as limestone pinnacles beneath the surface soil profile. Marine sediments and guano deposition have formed the Island's phosphatic soils.
Land degradation risk	Christmas Island soils are generally highly permeable and there is little runoff, water or wind erosion. During the wet season runoff can occur during heavy rainfall causing some risk of soil erosion and sedimentation, however this is usually short lived.
Waterbodies	Perennial surface water on Christmas Island is limited to spring fed streams on coastal or sloping areas of the Island. Such areas are largely confined to Hosnies Spring and The Dales wetland areas, which are both listed as Ramsar wetlands and are listed in the Directory of Important Wetlands in Australia. The boundary of the closest Ramsar site to the application areas is the Hosnies Spring Ramsar site, which is 390 metres south.
Flora	Christmas Island is home to 242 native plant species, including 18 endemic species. Three threatened flora species (under the EPBC Act) are known from Christmas Island. These are: • *Asplenium listeri;* • *Tectaria devexa* var. *minor;* and • *Pneumatopteris truncata* These species have not been previously recorded within the application areas. The closest record of these species to the application area is *Tectaria devexa* var. *minor,* recorded around 17 metres from the 100-MCP-SP-CENTRAL-MB2 application area, on the opposite side of a road. Two priority flora species are known to occur on Christmas Island, both listed as Priority 1 by DBCA. These species are • *Clerodendrum inerme* • *Acalypha lanceolata* var. *lanceolata* These species have not been previously recorded within the application areas. The closest record of these species to the application area is *Acalypha lanceolata* var. *lanceolata* recorded around 485 metres from the application area.
Ecological communities	No threatened or priority ecological communities occur on Christmas Island.
Fauna	Christmas Island provides habitat for 14 land bird species and nine seabird species. Four seabird and nine land bird species are endemic to the island. A further 108 migratory or vagrant bird species have been recorded on the island. Six of the island's endemic birds are listed as threatened under the EPBC Act.

Characteristic	Details
	One endemic native mammal, the Christmas Island flying fox and five endemic reptiles, also occur on Christmas Island. Christmas Island also supports 20 crab species with three species considered locally significant, being the red, robber and blue crabs. No conservation listed fauna species have been historically recorded within the application area. The applicant has confirmed via a reconnaissance survey that no nest sites for the Abbott's booby currently occur in any of the application areas (CIP, 2024). The fauna species with the potential to occur within the application areas based on habitat suitability, are listed in Section A.2 below.

A.2. Vegetation type and condition of the application areas (CIP, 2014)

Site and area (ha)	Vegetation condition	Vegetation type
133A-MCP-STP9A – 3.99 ha	Good to very good	A blend of weed and native vegetation was recorded with dominant species including: *Arenga listeri, Planchonella duclita, Tristiropsis acutangula, Dysoxylum gaudichaudianum, Macaranga tanarius, Leea angulata, Syzygium nervosum, Ehretia javanica.* Low presence of weed species with *Leucaena leucocephala, Cordia curassavica, Clausena excavata.* Maximum canopy heights ranges from 22m to 28m.
133A-MCP-FIELD9MB1 – 3.01 ha	Degraded to completely degraded	Northern half of the block is cleared for mining. There is a southern portion of pinnacle field and a central strip of degraded, weed dominated including: *Macaranga tanarius, Dysoxylum gaudichaudianum, Polichinelle duclita, Leucaena leucocephala, Cordia curassavica, Clausena excavata* and *Muntingia calabura.* Maximum canopy height of 17m.
133A-MCP-STP23P – 2.87 ha	Completely degraded	Cleared for mining
133A-MCP-STP22P – 3.82 ha	Completely degraded	Cleared for mining
133A-MCP-STP9C – 2.22 ha	Completely degraded	Cleared for mining
100-MCP-SP-CENTRAL-MB1 – 22.12 ha	Completely degraded	A blend of weed and native vegetation was recorded with dominant species including: Fern fields, *Leucaena leucocephala, Cordia curassavica, Muntingia calabura; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Ficus microcarpa, Melochia umbellata, Tristiropsis acutangula.* Low density with maximum canopy heights recorded as 3 – 7m.
100-MCP-SP-CENTRAL-MB2 – 50.5 ha	Good to degraded	Medium to low density. A blend of weed and native vegetation was recorded with dominant species including: fern fields, *Leucaena leucocephala, Cordia curassavica, Muntingia calabura Aleurites moluccanua; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Ficus microcarpa, Melochia umbellata, Tristiropsis acutangula, Arenga listeri, Pittosporum ferrugineum.* Maximum canopy heights range from 12m in the north to 20m in the southern part of the block.
100-MCP-SP-CENTRAL-MB3 – 33.98 ha	Good to degraded	Medium to low density. A blend of weed and native vegetation was recorded with dominant species including: Fern fields, *Leucaena leucocephala, Cordia curassavica, Delonix regia, Adenanthera pavoninananthera, Melia azedarach; Macaranga tanarius, Dysoxylum gaudichaudianum, Ficus microcarpa, Pittosporum ferrugineum, Claoxylon indicum, Pipturus argenteus.*

		Maximum canopy heights range from 7m in the north to 22m in the middle.
100-MCP-SP-SOUTH-MB1 – 16.73 ha	Degraded to completely degraded	Low density with a blend of weeds and native vegetation. Dominant species including: Fern fields, *Leucaena leucocephala, Cordia curassavica, Muntingia calabura; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Ficus microcarpa, Melochia umbellata, Tristiropsis acutangula, Arenga listeri, Cloaxylon indicium, Pipturus argenteus.* Maximum canopy heights recorded as 18m in the north and 3m in the south.
100-MCP-SP-SOUTH-MB2 – 30.63 ha	Degraded	A blend of weed and native vegetation was recorded with dominant species including: Fern fields, *Leucaena leucocephala, Cordia curassavica, Delonix regia, Muntingia calabura; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Ficus microcarpa, Melochia umbellata, Tristiropsis acutangula, Pittosporum ferrugineum, Pipturus argenteus.* Low density with maximum canopy heights recorded as 12 – 18m.
100-MCP-SP-EAST-MB3 – 10.49 ha	Degraded to completely degraded	A blend of weed and native vegetation was recorded with dominant species including: Fern fields, *Leucaena leucocephala, Cordia curassavica, Muntingia calabura; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Ficus microcarpa, Tristiropsis acutangula, Arenga listeri, Cloaxylon indicium.* Low density with maximum canopy heights recorded as 12m in the north and 17m in the south.
100-MCP-WP-EAST-MB4 – 2.54 ha	Degraded	A blend of weed and native vegetation was recorded with dominant species including: *Leucaena leucocephala, Cordia curassavica, Muntingia calabura; Macaranga tanarius, Guetta speciosa, Dysoxylum gaudichaudianum, Tristiropsis acutangula, Pipturus argenteus.* Low density with maximum canopy heights recorded as 15m in the north and 8m in the south.

A.3 Flora analysis table

There are three threatened flora species and two priority flora species known from Christmas Island, as shown below.

Species name	Conservation status	Suitable habitat present?
Tectaria devexa var. minor	Endangered; EPBC Act	Potential
Asplenium listeri	Critically endangered; EPBC Act	No
Pneumatopteris truncata	Critically endangered; EPBC Act	No
Clerodendrum inerme	Priority 1; listed by DBCA	No
Acalypha lanceolata var. *lanceolata*	Priority 1; listed by DBCA	No

A.3 Fauna analysis table

With consideration of the site characteristics set out above, relevant datasets (see Appendix D), and biological survey information, the following conservation significant fauna species may occur within the application area.

Species name	Conservation status	Suitable habitat features? [Y/N/Potential]	Identified within the application area? [Y/N]
Abbott's booby (*Papasula abbotti*)	Endangered; EPBC Act	Y	N
Christmas Island emerald dove (*Chalcophaps indica natalis*)	Endangered; EPBC Act	Y	N
Christmas Island flying fox (*Pteropus melanotus natalis*)	Critically endangered; EPBC Act	Roosting – N Foraging - Y	N
Christmas Island goshawk (*Accipiter fasciatus natalis*)	Endangered; EPBC Act	Y	N
Giant gecko (*Cyrtodactylus sadleiri*)	Endangered; EPBC Act	Y	N
Christmas Island hawk-owl (*Ninox natalis*)	Vulnerable; EPBC Act	Y	N
Christmas Island thrush (*Turdus poliocephalus erythropleurus*)	Endangered; EPBC Act	Y	N
Golden bosunbird (*Phaethon lepturus fulvus*)	Endangered; EPBC Act	Y	N
Red crab (*Gecarcoidea natalis*)	Not conservation listed (keystone species)	Y	Y
Robber crab *(Birgus latro*)	Not conservation listed	Y	N

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): ***"Native vegetation should not be cleared if it comprises a high level of biodiversity."*** Assessment: All sites proposed for clearing have been previously cleared and contain regrowth vegetation, much of which is in a good to completely degraded (Keighery, 1994) condition, with a high weed load. The applicant has committed to not disturbing any primary rainforest or areas of high environmental value within the Christmas Island National Park. The application areas are unlikely to contain significant habitat for conservation listed flora known from Christmas Island, and do not contain high value fauna habitat relative to the extent of pristine primary rainforest in the surrounding National Park. Given the above, the application areas are not likely to contain a high level of biodiversity.	Not likely to be at variance	No
Principle (b): ***"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."*** Assessment: The application areas contain suitable habitat for conservation significant fauna. Impacts to fauna are assessed under Section 3.2.1.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): ***"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."*** Assessment:	May be at variance	Yes *Refer to Section 3.2.3, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Three threatened flora species (under the EPBC Act) are known to occur on Christmas Island, being *Asplenium listeri*, *Pneumatopteris truncata* and *Tectaria devexa* var. minor. The proposed clearing is not likely to impact on occurrences of, or suitable habitat for *Asplenium listeri* or *Pneumatopteris truncata,* however, may impact on suitable habitat for *Tectaria devexa var. minor* noting the proximity of known records of this species to the 100-MCP-SP-CENTRAL-MB2 block application area. Potential impacts to this species are detailed under Section 3.2.3.		
Principle (d): ***"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."*** Assessment: No threatened ecological communities have been recorded on Christmas Island.	Not at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): ***"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."*** Assessment: The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30% of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). Christmas Island retains around 75 per cent native vegetation (10,125 hectares) of which 84% (64% of the total island area) is protected within the Christmas Island National Park. The proposed clearing equates to the loss of around 1.7% of the total remaining vegetation on Christmas Island. The extent of native vegetation on Christmas Island is therefore consistent with the national objectives and targets for biodiversity conservation in Australia.	Not likely to be at variance	No
Principle (h): ***"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."*** Assessment: Two of the application areas are within 10 metres of Christmas Island National Park. The assessment of impacts to the National Park is assessed under Section 3.2.2.	May be at variance	Yes *Refer to Section 3.2.2, above.*
Environmental value: land and water resources		
Principle (f): ***"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."*** Assessment: There are no watercourses or wetlands mapped within 100 metres of the application areas. The reconnaissance survey did not identify any riparian vegetation within the application areas. Noting the distance of the application areas to the closest watercourse or wetland, and the extent of primary rainforest that buffers these areas, the proposed clearing of regrowth vegetation in largely good to completely	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
degraded condition is not likely to directly impact on any riparian vegetation and is therefore not likely to be at variance to this principle.		
Principle (g): ***"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."*** Assessment: The phosphatic soils within the application area are not typically prone to wind erosion. Around 70 per cent of the island's annual rainfall is taken up by its flora. The remaining infiltrates through the soil to recharge groundwater (CIP, 2024). The soil and underlying limestone rock on the island is very porous and there is minimal runoff except during torrential wet season downpours. Infiltration tests indicate that soil infiltration rates are typically substantially higher than hourly rainfall intensities. Therefore, the risk of water erosion, waterlogging and sedimentation is mostly localised to compacted areas such as roads and stockpile pads during high rainfall. Therefore, the proposed clearing has a low risk of resulting in water erosion, wind erosion or waterlogging. The Delegated Officer also considered the erosion control measures that are set out in the applicant EMP (see Section 3.3). Noting the above, the proposed clearing is not likely to result in appreciable land degradation.	Not likely to be at variance	No
Principle (i): ***"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."*** Assessment: Due to the high natural rate of infiltration on Christmas Island, there is limited surface drainage, and erosion and sedimentation are generally localised to compacted areas such as roads and stockpiles. Noting the distance to the nearest watercourse, and vegetative buffer that exists between the application area and the nearest mapped watercourses, it is unlikely that the proposed clearing will impact on the quality of surface water. The Delegated Officer also considered the erosion control measures that are set out in the applicant EMP (see Section 3.3). Phosphate mining on Christmas Island does not intercept groundwater. The proposed clearing is not likely to deteriorate the quality of groundwater noting the extent of surrounding vegetation and high groundwater infiltration rates.	Not likely to be at variance	No
Principle (j): ***"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."*** Assessment: The proposed clearing is not likely to cause or exacerbate flooding noting the presence of highly permeable soils on Christmas Island, absence of watercourses within the application areas, and presence of extensive vegetation surrounding the application areas.	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present

in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering the location of the application area, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from:
Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

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

Appendix D. GIS Databases and References

D.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Cadastre (LGATE-218)
- Contours (DPIRD-073)
- Environmentally Sensitive Areas (DWER-046)
- Imagery
- Ramsar Sites (DBCA-010)

Restricted GIS Databases used:

- Abbott Booby Nests (2012)
- Christmas Island Vegetation (2014)
- Compiled Abbott's Booby Nest Sites (2017)
- Known Giant Gecko locations (2015)
- Known Abbotts Booby Locations (2015)
- National Park Boundary
- RAMSAR Wetlands (2013)
- Red Crab Burrow Density Grid
- Red Crab Migration Infrastructure
- Red Crab Migration Fencing
- Tectaria devexa var minor (2015)
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna

- Vegetation Level 1 (2013)

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