Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	4841/5
Permit type:	Purpose Permit
Applicant name:	Round Oak Jaguar Pty Ltd
Application received:	1 September 2022
Application area:	100 hectares
Purpose of clearing:	Mineral production and mineral exploration
Method of clearing:	Mechanical Removal
Tenure:	Exploration Licence 37/258
	Mining Lease 37/44
	Mining Lease 37/1132
	Mining Lease 37/1153
	Mining Lease 37/1230
	Mining Lease 37/1257
	Mining Lease 37/1290
Location (LGA area/s):	Shire of Leonora
Colloquial name:	Jaguar Base Metals Project

1.2. Description of clearing activities

Round Oak Jaguar Pty Ltd proposes to clear up to 100 hectares of native vegetation within a boundary of approximately 3,888 hectares, for the purpose of mineral production and mineral exploration. The project is located approximately 45 kilometres north west of Leonora, within the Shire of Leonora.

The previous permit for the application area, CPS 686/3, was granted on 19 October 2006 and expired on 18 November 2011. Approximately 23.95 hectares were cleared under CPS 686/3 with approximately 2.66 hectares rehabilitated (Jabiru, 2012b).

Clearing permit CPS 4841/1 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 8 March 2012 and was valid from 31 March 2012 to 31 March 2017. The permit authorised the clearing of up to 100 hectares of native vegetation within a boundary of approximately 3,882 hectares, for the purpose of mineral production and mineral exploration.

CPS 4841/2 was granted on 30 July 2015. The amendment updated the permit holder name from Jabiru Metals Limited to Independence Jaguar Limited. The permit boundary and total area of clearing authorised remained unchanged.

CPS 4841/3 was granted on 23 March 2017. The amendment updated the permit holder name from Independence Jaguar Limited to Independence Jaguar Pty Ltd and extended the permit duration by five years. The permit boundary and total area of clearing authorised remained unchanged.

CPS 4841/4 was granted on 17 March 2022. The amendment updated the permit holder name from Independence Jaguar Pty Ltd to Round Oak Jaguar Pty Ltd and extended the permit duration by five years. The permit boundary and total area of clearing remained unchanged.

On 1 September 2022, the Permit Holder applied to amend CPS 4841/4 to increase the permit boundary by approximately six hectares in order to develop a new tailings storage facility on Mining Lease 37/1257. The total area of clearing remains unchanged.

The proponent reported that approximately 28.986 hectares have been cleared pursuant to permit 4841/4 (as of 30 June 2022), most of which was for the establishment on a tailings storage facility on Mining Lease 37/1153 (Aeris, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	19 January 2023
Decision area:	100 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 1 September 2022. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received. The application was readvertised for seven days due to a change in the application area, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix D), supporting information provided by the applicant including the results of previous flora and vegetation surveys and fauna surveys, the clearing principles set out in Schedule 5 of the EP Act (Appendix B), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the loss of native vegetation that is suitable habitat for the peregrine flacon and grows in association with a watercourse; and
- potential land degradation in the form of soil erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion; and
- undertake pre-clearing inspections to identify the presence of incised drainage channels and avoid clearing of *Eucalyptus camaldulensis* located within 10 metres of an incised drainage channel.

The assessment has not changed since the assessment for CPS 4841/4. The Delegated Officer determined that the proposed boundary increase is not likely to lead to an unacceptable risk to environmental values.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

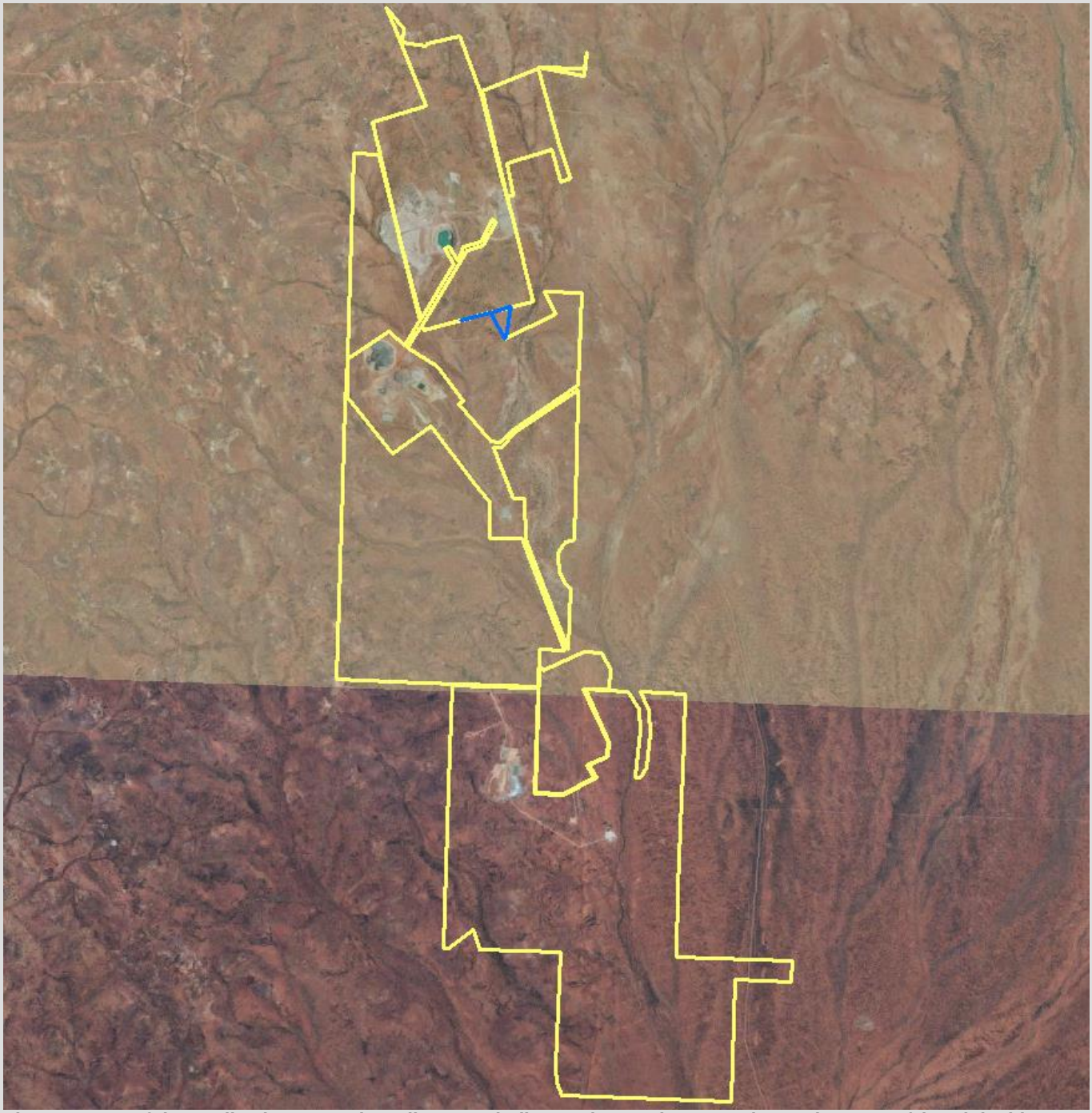

Figure 1. Map of the application area. The yellow area indicates the previous permit area (CPS 4841/4) and the blue area indicates the additional areas included as part of this application.

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:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)

- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- 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 and mitigation measures

The Permit Holder has advised that all native vegetation clearing at the mine site is managed by a 'Permit To Work' (PTW) system which requires all clearing to be signed off by a company environmental representative, surveyor and authorised PTW duty officer (Round Oak Jaguar Pty Ltd, 2022). Alternatives to clearing and impact minimisation measures will be explored prior to signing off the PTW (Round Oak Jaguar Pty Ltd, 2022). The Delegated Officer notes that this internal system minimises the risk of unauthorised clearing taking place at the mine site.

The Delegated Officer is satisfied that the applicant has made a reasonable effort to avoid and minimise 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) reveals that the assessment against the clearing principles has not changed significantly from the Clearing Permit Decision Report CPS 4841/4. The additional proposed clearing area is not likely to cause significant environmental impacts.

3.3. Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 25 October 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application. The application was later re-advertised for seven days on 15 November 2022 due to a change in the application area. No submissions were received in relation to this application during this period.

There is one native title claim over the area under application (DPLH, 2023). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are four registered Aboriginal Sites of Significance within the application area (DPLH, 2023). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:
- A Programme of Work approved under the *Mining Act 1978*.
- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. From aerial imagery it can be observed that the application area is surrounded by native vegetation, drainage lines, and mining infrastructure (GIS Database).
Ecological linkage	According to aerial imagery and available databases, the application area does not form part of any formal or informal ecological linkages (GIS Database).
Conservation areas	The application area does not intersect any mapped conservation areas (GIS Database). The closest known conservation area is located approximately 81.5 kilometres (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations: 18: Low woodland; Mulga (*Acacia aneura*); and 28: Open low woodland; Mulga (GIS Database). Several flora and vegetation surveys have been conducted over the application area, two of these surveys were conducted by, Ecotec (2007a), and Outback Ecology Services (2009). Outback Ecology Services (2009) states that the survey area was dominated by Mulga woodlands, shrubs and ephemeral creek lines. Typical vegetation would be described as: Low (Open) Woodland of *Acacia aneura* over Open Shrubland of *Acacia* and *Eremophila* spp. over Low Open Shrubland of *Eremophila* spp. *Acacia aneura* and *Eremophila* species were present in virtually every quadrat and relevé with *Eremophila margarethae* dominating the understorey over much of the survey area (Outback Ecology Services, 2009). Ecotec (2007a) described the main vegetation type as acacia woodland, with *Acacia aneura* (and subspecies) being the dominant species. Smaller Acacias (such as *A. tetragonophylla* and *A. acuminata*) and a variety of *Eremophila* species dominate the understorey vegetation, which is generally sparse throughout the area and *Eucalyptus camaldulensis* is found along the larger defined creek lines (Ecotec, 2007a). Rocky hills in the area characteristically have very little topsoil and sparse vegetation with flora species present generally consistent with the surrounding low lying areas, comprising predominately *Acacia* and *Eremophila* species (Ecotec, 2007a). The presence of mulga "groves" at the foot of drainage lines descending from the hills was noted as well (Ecotec, 2007a).
Vegetation condition	The vegetation surveys (Ecotec, 2007a; Outback Ecology Services, 2009) and aerial imagery indicate the vegetation within the proposed clearing area is in Poor to Completely Degraded (Trudgen, 1991) condition. The full Trudgen (1991) condition rating scale is provided in Appendix C.
Climate and landform	The application area is located in an arid zone with an average annual rainfall (Leonora Station) of 236.4 millimetres (BoM, 2023).
Soil description	The soil within the application area is mapped as units BE3 and BE6 (GIS Database). These soil units are described by Northcote et al. (1960-68) as: **BE3:** Broken slopes and ridges characterized by breakaways, generally on gneissic granites and allied rocks; ironstone gravel pavement variably present: chief soils seem to be shallow earthy loams with some shallow soils, both underlain by a red-brown hardpan. Associated are much mottledand pallid-zone material along the slope of the breakaway with some block laterite. **BE6:** Extensive flat and gently sloping plains, which sometimes have a surface cover of gravels and on which redbrown hardpan frequently outcrops: chief soils are shallow earthy loams.
Land systems	The application area has been mapped as occurring on the Bevon, Jundee, Monk, Nubev, Teutonic, Violet and Wyarri land systems, with the Jundee and Violet land systems covering most of the application area (DPIRD, 2023). The Bevon land system is described as irregular low ironstone hills, with stony lower slopes supporting mulga shrublands (Pringle et al., 1994). Within this land system the soils on breakaway slopes and drainage tracts are susceptible to soil erosion, particularly if perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994). The Jundee land system is described as hardpan plains with ironstone gravel mantles, supporting mulga shrublands (Pringle et al., 1994). Impedance to natural sheet flows can initiate

Characteristic	Details
	soil erosion and cause water starvation and consequent loss of vigour in vegetation downslope. Gravel mantles provide effective protection against soil erosion (Pringle et al., 1994). The Monk land system is described as hardpan plains with occasional sandy banks, supporting mulga tall shrublands and wanderrie grasses (Pringle et al., 1994). Drainage tracts are mildly susceptible to water erosion (Pringle et al., 1994). The Nubev land system is described as gently undulating stony plains, minor limonitic low rises and drainage floors, supporting mulga and halophytic shrublands (Pringle et al., 1994). Drainage zones in this land system are moderately susceptible to soil erosion, particularly where perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994). Disturbance of the protective stone mantle on saline stony plains is also likely to initiate water erosion (Pringle et al., 1994). The Teutonic land system is described as hills and stony plains on acid volcanic rocks, supporting acacia shrublands (Pringle et al., 1994). This land system is generally not susceptible to soil erosion, partly as a consequence of extensive stone mantles (Pringle et al., 1994). The Violet land system is described as undulating stony and gravelly plains and low rises, supporting mulga shrublands (Pringle et al., 1994). This land system has abundant mantles which provide effective protection against soil erosion over most of the land system (Pringle et al., 1994). In areas which have been disturbed the soil becomes moderately susceptible to water erosion (Pringle et al., 1994). The narrow drainage tracts within this system are also mildly susceptible to soil erosion if disturbed (Pringle et al., 1994). The Wyarri land system is described as granite domes, hills and tor fields with gritty-surfaced fringing plains supporting mulga and granite wattle shrublands (Pringle et al., 1994). This land system is generally not susceptible to soil erosion, partly as a consequence of heavy, protective soil mantles (Pringle et al., 1994).
Waterbodies	The desktop assessment and aerial imagery indicated that there are several minor, non-perennial watercourses transecting the area proposed to be cleared (GIS Database).
Hydrogeography	The application area is located within the Goldfields Groundwater Area which is legislated by the *RIWI Act 1914* (GIS Database). The mapped groundwater salinity is 1,000-3,000 milligrams per litre total dissolved solids which is described as brackish to saline (GIS Database).
Flora	There is are records of one Priority flora species within the application area (IRC Environment, 2005; GIS Database). There are no records of Threatened flora within the application area (IRC Environment, 2005; GIS Database).
Ecological communities	The application area is not located within any known or mapped Threatened Ecological Communities or Priority Ecological Communities (GIS Database).
Fauna	The fauna survey conducted by Ecotec (2007b) recorded a peregrine falcon within the application area. There are no records of Threatened or Priority species in the application area (GIS Database).

A.2. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Peregrine falcon	OS	Y	Y	0 km	1,756	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

(Ecotec, 2007b; GIS Database)

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: The fauna survey conducted by Biota (2005) recorded a peregrine falcon in the application area. The peregrine falcon has a large distribution and is found in most habitats. The presence of this species does not represent a high level of biodiversity for the application area. In the original assessment of this permit, five Priority flora species had been identified during the vegetation surveys, however, a review of the conservation status of these species shows only one is now listed as a Priority species. This species is *Lysiandra baeckeoides* (previously named *Phyllanthus baeckeoides*) and it is listed as a Priority 3 species. This species primarily grows on rocky hills, although it was observed in some of the mulga "groves" at the foot of drainage lines as well as in areas that had been disturbed, *L. baeckeoides* did not appear to be adversely affected by disturbance (Ecotec 2007a; IRC Environment, 2005). This flora species is not restricted to the application area and has a wide distribution across the Murchison bioregion and into the Great Victoria Desert (Western Australian Herbarium, 1998-). The proposed amendment is unlikely to have significant impact on this species. Ecotec (2007a) noted that most of the species identified during the survey are common throughout the northern Goldfields region. The application area is not located within any known or mapped Priority Ecological Communities (GIS Database). Jims Seeds, Weeds & Trees (2004) and Outback Ecology Services (2009) recorded several introduced species. None of the weed species recorded are Weeds of National Significance or Declared Pests. Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.	Not likely to be at variance (as per CPS 4841/1)	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 Peregrine Falcon was recorded in the application area (Biota, 2005). This species occurs across most of Australia in a wide variety of habitats and has a large home range, typically of 20-1,500 square kilometres (Biota, 2005). Ecotec (2007b) notes that large trees (such as *Eucalyptus camaldulensis)* within the creek lines may provide suitable nesting sites for these and bird species, and should therefore be avoided where possible. Given vegetation in the application area has been impacted by grazing and is considered well represented on a regional basis, it is unlikely that the application area represents significant fauna habitat. However, potential impacts to large *Eucalyptus camaldulensis* trees may be minimised by the implementation of a flora management condition.	Not likely to be at variance (as per CPS 4841/1)	No
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: According to available databases, there are no records of Threatened flora within the application area (GIS Database). No Threatened flora was recorded during the vegetation surveys undertaken by Jims Seeds, Weeds & Trees (2004) in May and September 2004, Ecotec (2007a) from 29 January to 1 February 2007 and Outback Ecology Services (2009) from 21 to 25 September 2009.	Not likely to be at variance (as per CPS 4841/1)	No
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: According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is approximately 105 kilometres north west of the application area (GIS Database). No TECs were recorded during the vegetation surveys undertaken by	Not likely to be at variance (as per CPS 4841/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Ecotec (2007a) from 29 January to 1 February 2007 and Outback Ecology Services (2009) from 21 to 25 September 2009.		
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 application area falls within the Murchison Bioregion of the Interim Biogeographic Regionalisation for Australia (GIS Database). Over 99 per cent of the pre-European vegetation still exists in the Murchison Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 18 and 28 (GIS Database). These vegetation associations have not been extensively cleared as over 98 percent of the pre-European extent of these vegetation associations remain uncleared at both the state and bioregional level (Government of Western Australia, 2019).	Not at variance (as per CPS 4841/1)	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: The application area is not located within or nearby any conservation areas (GIS Database). Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of any known conservation areas.	Not likely to be at variance (as per CPS 4841/1)	No
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 several minor, non-perennial watercourses within the application area (GIS Database). Ecotec (2007a) notes creek lines are located throughout the survey area ranging from small water courses to large ephemeral creek lines that periodically carry extremely large volumes of water. These water ways support large Eucalypts, predominately *Eucalyptus camaldulensis* (River Red Gum), which are considered locally significant for fauna habitat and cultural purposes (Ecotec, 2007a; Jabiru, 2012a). *Eucalyptus camaldulensis* has a widespread distribution across Australia and is found growing along watercourses and billabongs (Western Australian Herbarium, 1998-). Jabiru (2012a) states that the areas of likely disturbance avoid the principal water courses in the area and that where infrastructure is likely to cross creek-lines or water ways Jabiru is committed to causing minimal impact on the associated sensitive creek-line vegetation due to its ecological and heritage values. Jabiru (2012a) adds that minor works in relation to broad creek crossings (which are already cleared) will be managed to ensure there is little impact on the vegetation bordering the principal creek systems in the area. Potential impacts to vegetation growing in association with a watercourse as a result of the proposed clearing can be managed by a vegetation management condition to avoid clearing in watercourses where possible and maintaining water flows. Potential impacts to *Eucalyptus camaldulensis* as a result of the proposed clearing may be minimised by the implementation of a flora management condition to avoid clearing *Eucalyptus camaldulensis* located within 10 metres of a watercourse.	At variance (as per CPS 4841/1)	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The Commissioner for Soil and Land Conservation provided advice in relation to the application area during the previous clearing permit application (CPS 686/1). The Commissioner advised that accelerated soil erosion is likely to occur on the red sands and earthy soils where protective stone or gravel mantles are disturbed (DAWA, 2005). The Commissioner notes that accelerated soil erosion is unlikely to occur if sensitive areas such as drainage lines are avoided or adequate provision is made to	May be at variance (as per CPS 4841/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
maintain the natural surface flow regime (DAWA, 2005). The Commissioner recommended that conditions be imposed to avoid sensitive areas and mitigate and prevent soil erosion and loss of vegetation (DAWA, 2005). Given the characteristics of the land systems (see section A.1) where the application area is located, the mapped soils are moderately susceptible to erosion (Pringle et al., 1994). Noting the location of the application area, the proposed clearing is likely to have an appreciable impact on land degradation. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition to prevent cleared areas from being exposed for extended period of time, and by the implementation of a vegetation management condition to avoid clearing within drainage lines where possible and maintain water flows.		
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: The application area is not located within a Public Drinking Water Source Area (GIS Database). There are no permanent waterbodies or watercourses within the application area, however, there are numerous minor non perennial watercourses that pass through the application area (GIS Database). It is expected that these would only flow after or during significant seasonal rainfall events, or substantial localised falls. Given no permanent water courses, wetlands, or Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality (GIS Database).	Not likely to be at variance (as per CPS 4841/1)	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: With an average annual rainfall of 236.4 millimetres and an average evaporation rate of approximately 3,400 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2023). Given the likelihood of little surface flow, the proposed clearing is not likely to cause or increase the incidence or intensity of flooding.	Not likely to be at variance (as per CPS 4841/1)	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 its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.

Condition	Description
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Sources of information

D.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

D.2. References

Aeris Resources Limited (Aeris) (2022) Annual Clearing Report for Clearing Permits 4037/4 & 4841/4. Unpublished report prepared for the Department of Mines, Industry Regulation and Safety.

Biota (2005) Proposed Jaguar Mine Fauna Habitat and Fauna Assemblage Survey. Unpublished report for Jabiru Metals Limited dated February 2005.

BoM (2023) Bureau of Meteorology Website – Climate Data Online. Bureau of Meteorology. http://www.bom.gov.au/climate/data/ (Accessed 5 January 2023).

Department of Agriculture Western Australia (DAWA) (2005) Land Degradation Advice in relation to Clearing Permit Application CPS 686/1. Department of Agriculture Western Australia, October 2005.

Department of Environment Regulation (DER) (2014) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf

Department of Planning, Lands and Heritage (DPLH) (2023) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS (Accessed 5 January 2023).

Department of Primary Industries and Regional Development (DPIRD) (2023) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (Accessed 5 January 2023).

Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits.pdf#:~:text=This%20Procedure%3A%20Native%20vegetation%20clearing%20permit%20outlines%20how,%28EP%20Act%29%20and%20to%20manage%20granted%20clearing%20permits

Ecotec (WA) Pty Ltd (Ecotec) (2007a) Flora and Vegetation Assessment of the Teutonic Bore Area. Unpublished report for Jabiru Metals Limited dated January 2007.

Ecotec (WA) Pty Ltd (Ecotec) (2007b) Fauna Assessment of the Teutonic Bore Area. Unpublished report for Jabiru Metals Limited dated January 2007.

Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf

Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

IRC Environment (2005) Teutonic Bore / Jaguar Mine Site Rare Flora Survey. Unpublished report for Jabiru Metals Limited dated 8 June 2005.

Jabiru (2012a) Jaguar Operations Clearing Permit Application. Unpublished report dated January 2012.

Jabiru (2012b) Jaguar Base Metals Project for Clearing Permit 686/3. Unpublished report prepared for the Department of Mines, Industry Regulation and Safety.

Jims Seeds, Weeds & Trees (2004) Flora Survey - Jaguar/Teutonic Bore. Unpublished report for Pilbara Mines Limited dated September 2004.

Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) Atlas of Australian Soils, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.

Outback Ecology Services (2009) Jabiru Metals Bentley Stage 1, Vegetation and Flora survey. Unpublished report for Jabiru Metals Limited dated October 2009.

Pringle, H.J.R, Van Vreeswyk, A.M.E. and Gilligan, S.A. (1994) An inventory and condition survey of rangelands in the north-eastern Goldfields, Western Australia, Technical Bulletin No. 87., Department of Agriculture, South Perth, Western Australia.

Round Oak Jaguar Pty Ltd (2022) Jaguar Base Metals Project application for clearing permit within Exploration Licence E 37/258 and Mining Leases M37/44, M 37/1132, M 37/1153, M 37/1230, M 37/1257, M 37/1290. Round Oak Jaguar Pty Ltd, September 2022.

Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 09 January 2023).

4. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

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

(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.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

(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.

(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.

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

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

(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.

(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.

(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.