



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9556/1
Permit Holder:	BHP Nickel West Pty Ltd
Duration of Permit:	From 07 July 2022 to 07 July 2032

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 expansion of slag dump and associated processing infrastructure, associated activities and road corridor maintenance.

2. Land on which clearing is to be done

Lot 99 on Deposited Plan 220378, Karramindie
Lot 95 on Deposited Plan 220400, Karramindie
Lot 96 on Deposited Plan 220400, Karramindie
Lot 307 on Deposited Plan 52828, Yilkari
Lot 214 on Deposited Plan 220400, Feysville
Lot 110 on Deposited Plan 181097, Feysville
Lot 100 on Deposited Plan 212288, Feysville
Lot 101 on Deposited Plan 21228, Feysville
Lot 66 on Plan 14433, Feysville

3. Clearing authorised

The permit holder must not clear more than 231 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. 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.

5. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *weed*-affected soil, mulch, fill, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner in a single direction towards adjacent *native vegetation* to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

7. Wind erosion management

The permit holder must commence activities authorised under Condition 1 of this permit no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

8. Revegetation and rehabilitation (*temporary works*)

The permit holder must *revegetate* and *rehabilitate* areas cleared for temporary works within six months of the area no longer being required for the purpose for which it was cleared, unless the *CEO*, in writing, advises the permit holder to the contrary.

9. Fauna management - Malleefowl

- (a) In relation to the area cross-hatched yellow in Figures 1 - 3 of Schedule 1, prior to undertaking any clearing authorised under this permit, the permit holder shall engage a *fauna specialist* to inspect that area immediately prior to for the presence of *active (in use) Leipoa ocellata* (Malleefowl) mounds.
- (b) Where *active Leipoa ocellata* (Malleefowl) mounds are identified under condition 9(a) of this permit, the permit holder shall ensure that no clearing occurs within 50 metres of the identified *active (in use) Leipoa ocellata* (Malleefowl) mounds, during the months of September through to January.
- (c) Within two months of clearing authorised under this permit within areas cross-hatched yellow in Figures 1 - 3 of Schedule 1, the permit holder must provide the results of the inspection by the *fauna specialist* to the *CEO*.

PART III - RECORD KEEPING AND REPORTING

10. 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	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); and (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> in accordance with condition 5; and (g) actions taken to conduct directional clearing in accordance within condition 6 (h) actions taken to minimise wind erosion in accordance within Condition 6 (i) actions taken to <i>rehabilitate</i> and/or <i>revegetate</i> areas that were cleared for <i>temporary works</i>
2.	In relation to fauna management pursuant to condition 8	<ul style="list-style-type: none"> (a) the location of each <i>Leipoa ocellata</i> (Malleefowl) mound, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (b) actions taken to demarcate each <i>Leipoa ocellata</i> (Malleefowl) mound recorded and their relevant buffers; and (c) actions taken to avoid the clearing of <i>Leipoa ocellata</i> (Malleefowl) mounds.

11. Reporting

The permit holder must provide to the *CEO* the records required under condition 10 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
active (in use) Malleefowl (<i>Leipoa ocellata</i>) mound	means a mound with evidence of current Malleefowl (<i>Leipoa ocellata</i>) activity, such as: working of the mound; scratching; litter trails leading to the mound; or loose uncompacted surfaces. The form and structure of the mound will show that it is currently being prepared for egg laying or it already contains eggs;
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
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.
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the <i>CEO</i> as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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.
rehabilitate	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
temporary works	means access tracks, spoil areas, side tracks, site offices, storage areas, laydown areas, extraction sites, camps, project surveys, pre-construction activities, and similar works associated with a project activity that are temporary in nature.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and

Term	Definition
	Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway

MANAGER

NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

13 June 2022

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figures 1 - 3).

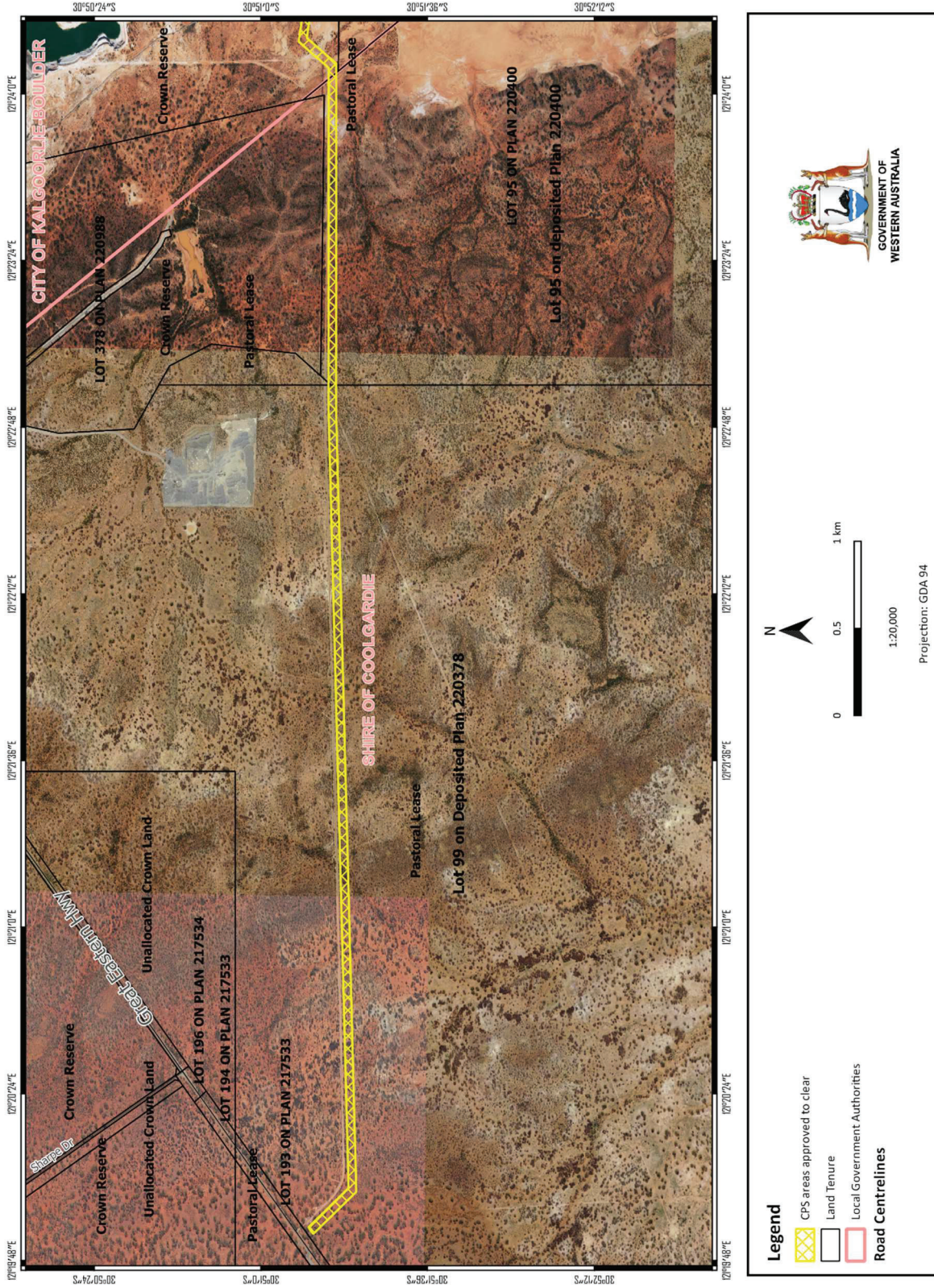


Figure 1: Map of the boundary of the area within which clearing may occur

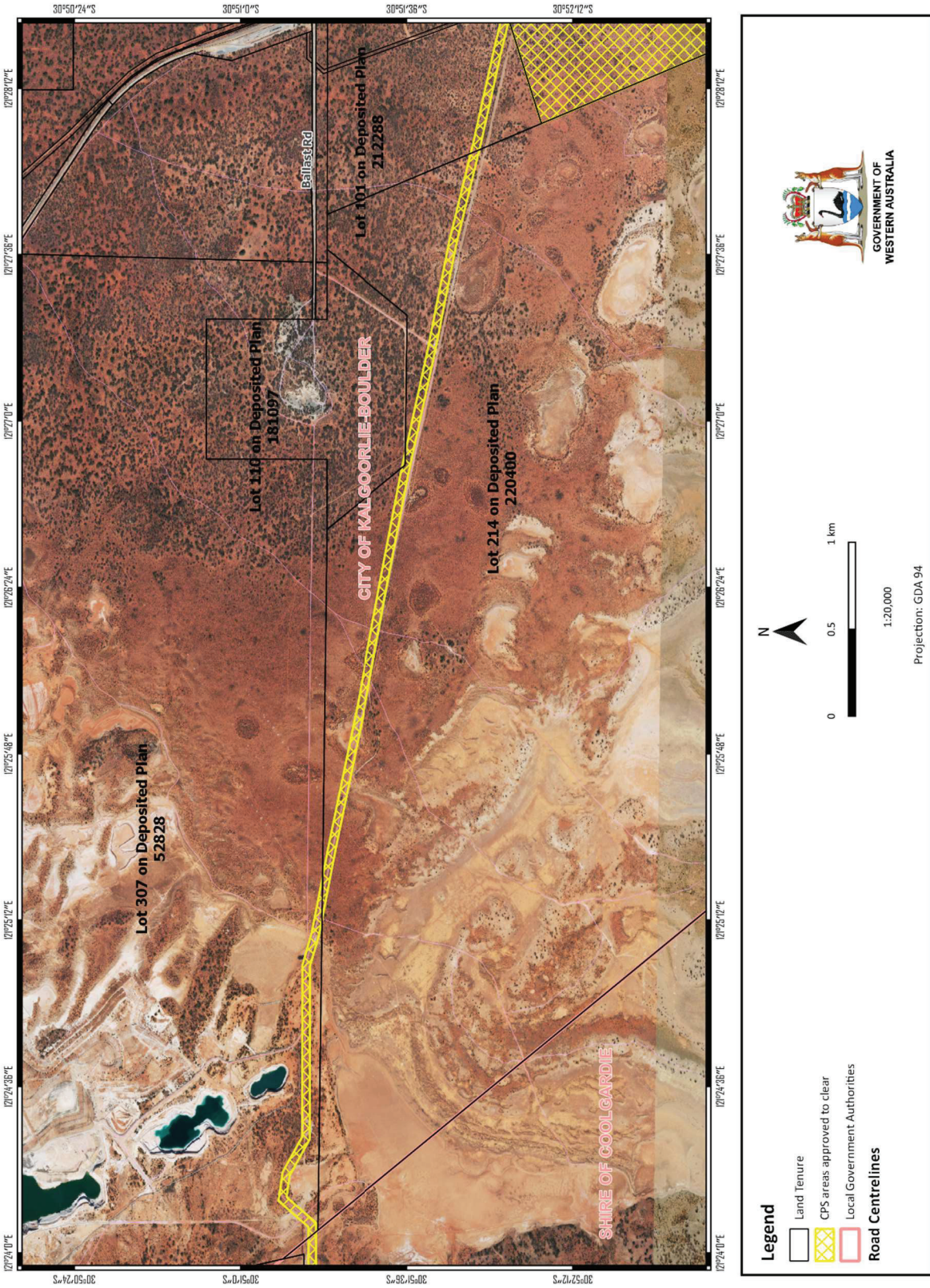
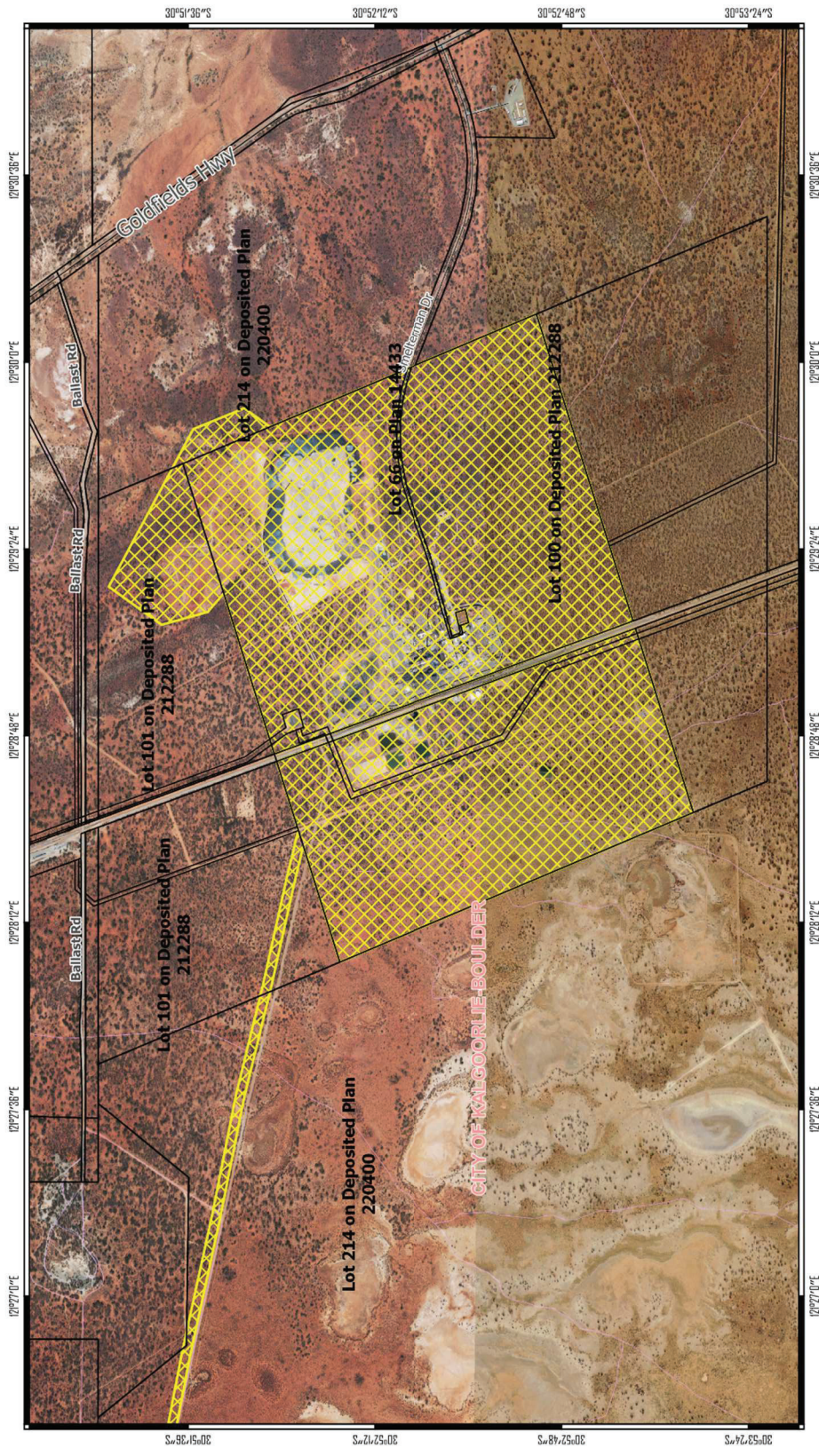


Figure 2: Map of the boundary of the area within which clearing may occur



Legend

- Land Tenure
- CPS areas approved to clear
- Local Government Authorities
- Road Centrelines**

N

0 0.5 1 km

1:20,000

Projection: GDA 94

GOVERNMENT OF WESTERN AUSTRALIA

Figure 3: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9556/1
Permit type:	Purpose permit
Applicant name:	BHP Nickel West Pty Ltd
Application received:	5 January 2022
Application area:	231 hectares of native vegetation
Purpose of clearing:	Maintenance activities and expansion projects at the Kalgoorlie nickel smelter
Method of clearing:	mechanical
Property:	Lot 99 on Deposited Plan 220378 Lot 95 on Deposited Plan 220400 Lot 96 on Deposited Plan 220400 Lot 307 on Deposited Plan 52828 Lot 214 on Deposited Plan 220400 Lot 110 on Deposited Plan 181097 Lot 100 on Deposited Plan 212288 Lot 101 on Deposited Plan 212288 Lot 66 on Plan 14433
Location (LGA area/s):	City of Kalgoorlie-Boulder and Shire of Coolgardie
Localities (suburb/s):	Karramindie, Yilkari and Feysville,

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within two different sections referred to as the road corridor (see Figures 1 – 2, Section 1.5) and Smelter Area (Figure 3, Section 1.5).

The application seeks approval to clear up to 231 hectares (ha) of vegetation within an application area of 705.8 ha. Significant projects considered in determining the required clearing area include the expansion of the slag dump (42 ha) within the Smelter Area. The application area within the road corridor (73 ha) has been included to support maintenance activities along the road between the Smelter Area and the Goldfields Highway. A number of future projects are likely to be undertaken on previously disturbed land and will be further assessed prior to execution.

The applicant has advised that the application is to clearing native vegetation associated with maintenance activities and/or expansion projects at the Kalgoorlie Nickel Smelter. Such activities may include but are not necessarily limited to:

- Processing, such as expansion of the slag dump.
- Processing infrastructure, such as:
 - storage facilities;
 - hardstands;
 - laydown areas;
 - roads;

- pipelines and;
- communications.
- associated activities, such as:
 - geotechnical investigations;
 - access tracks;
 - exploration;
 - perimeter / security fencing;
 - power lines;
 - topsoil stockpiling;
 - hydrological drilling (including pad and sump construction);
 - water bores (abstraction and monitoring) and;
 - borrow pits
- Future Transformation Projects, as determined by the business (BHP Nickel West Pty Ltd, 2022).

1.3. Decision on application

Decision:	Granted
Decision date:	13 June 2022
Decision area:	231 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (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 E.1), the findings of a flora, fauna and vegetation survey (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable habitat for malleefowl (*Leipoa ocellata*);
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- potential land degradation in the form of wind 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 and is unlikely lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures (see Section 4).

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;
- slow directional clearing to allow malleefowl and other fauna to move into adjacent vegetation ahead of the clearing activity and minimise impacts to individuals;
- requiring a fauna specialist to search for active malleefowl mounds prior to clearing, and avoid active mounds during breeding season if found, will ensure that no impacts to significant malleefowl breeding habitat will occur;
- staged clearing to minimise wind erosion; and
- rehabilitate any areas that were cleared for temporary purposes.



Clearing Permit Decision Report

1.5. Site map

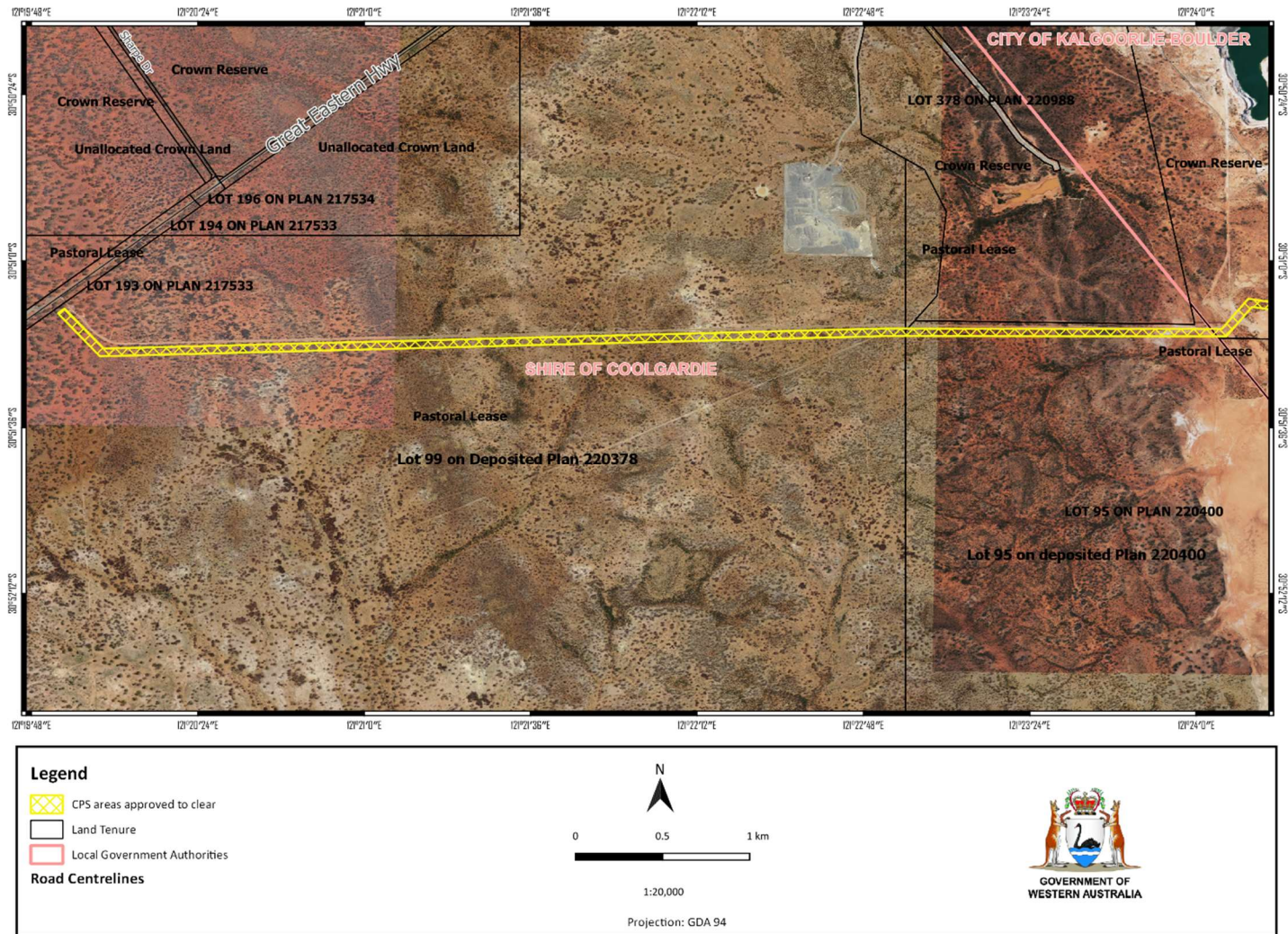
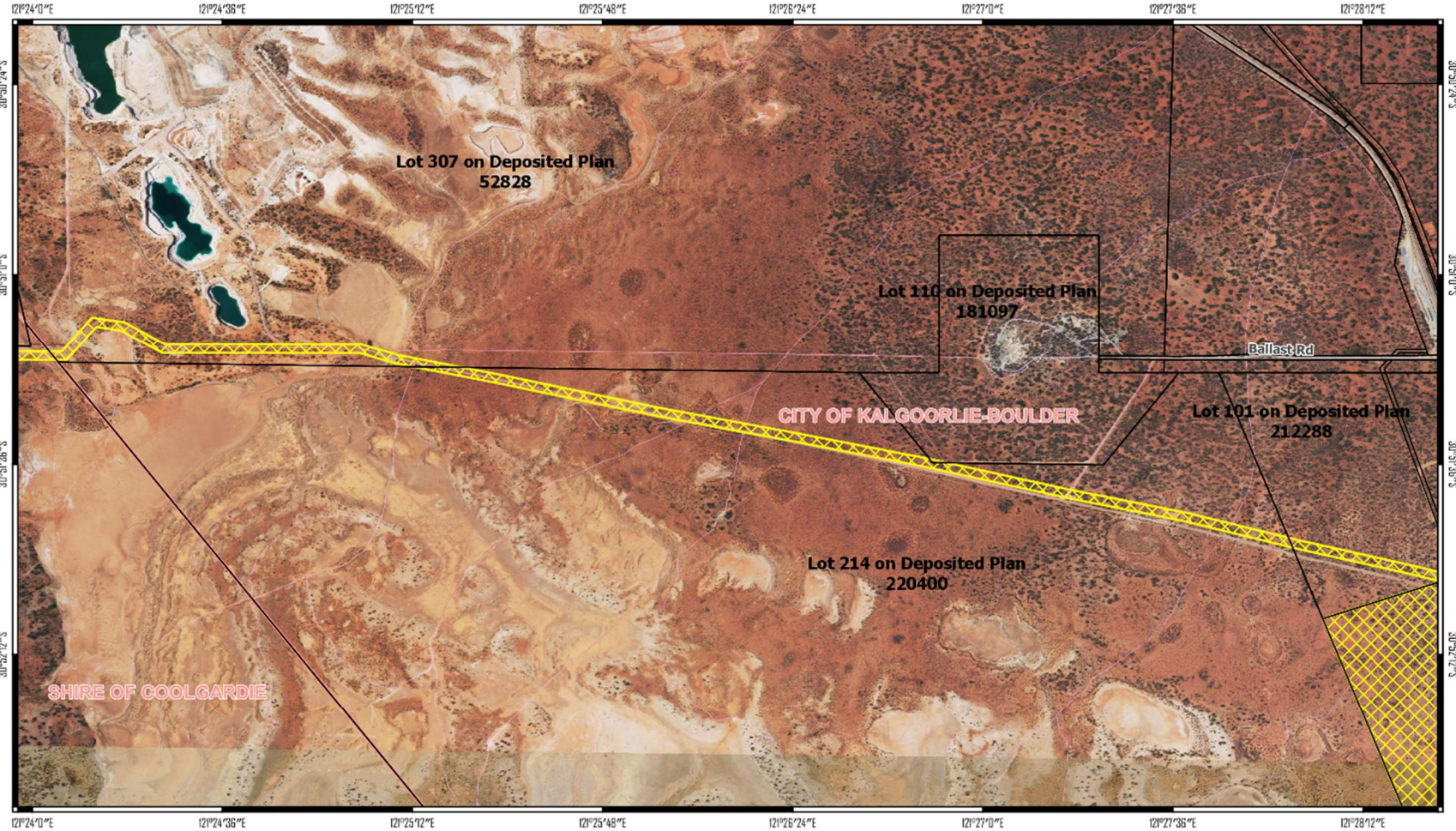






Figure 1. Map of the application area



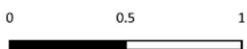
Legend

-  Land Tenure
-  CPS areas approved to clear
-  Local Government Authorities

Road Centrelines




0 0.5 1 km



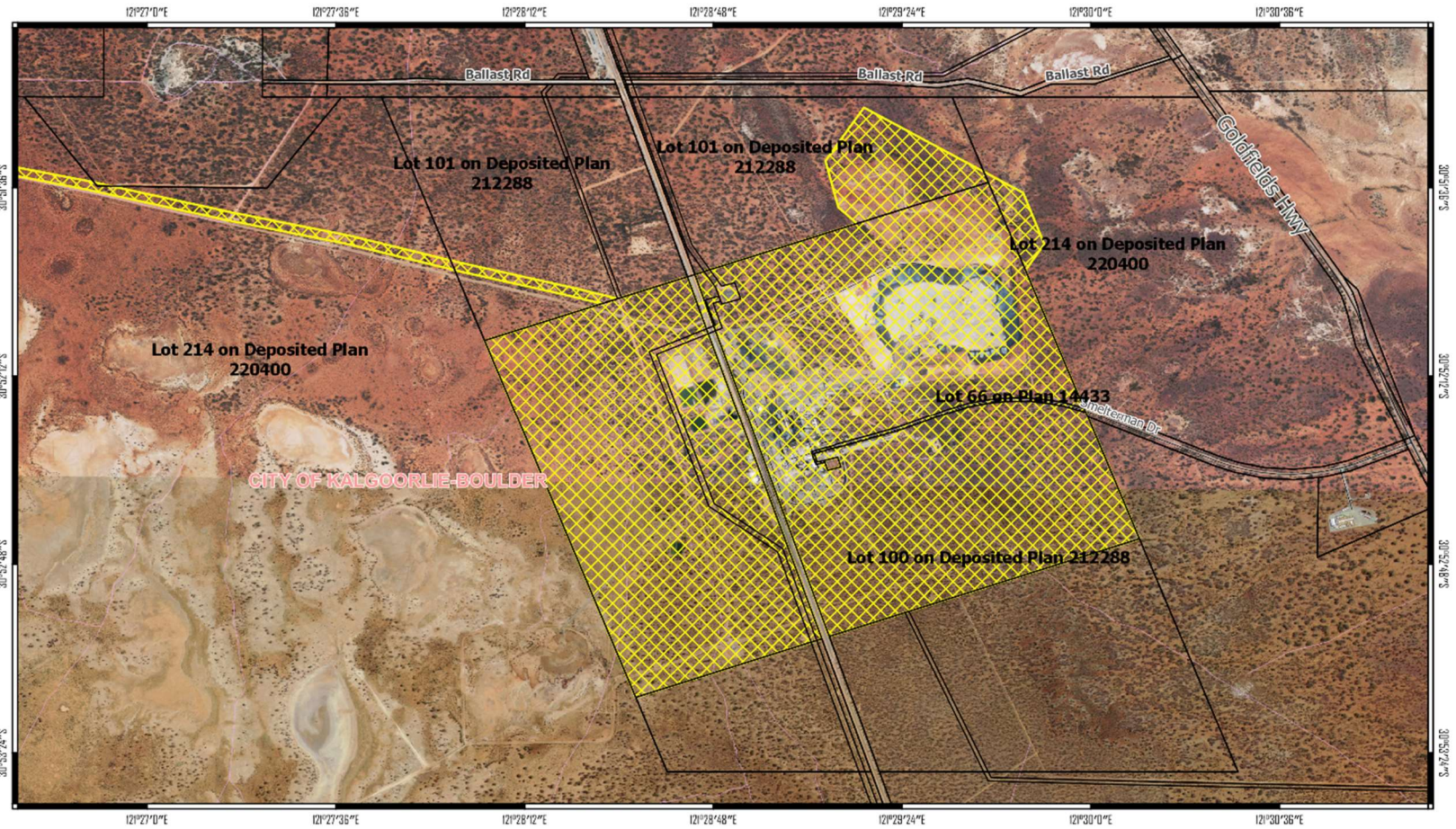
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Projection: GDA 94



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Figure 2. Map of the application area
 CPS 9556/1 13 June 2022






<p>Legend</p> <ul style="list-style-type: none"> Land Tenure CPS areas approved to clear Local Government Authorities <p>Road Centrelines</p>	<p>N</p>  <p>0 0.5 1 km</p>  <p>1:20,000</p> <p>Projection: GDA 94</p>	 <p>GOVERNMENT OF WESTERN AUSTRALIA</p>
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Figure 3. Map of the application area

The areas crosshatched yellow indicates the areas authorised to be cleared under the granted clearing permit.



Clearing Permit Decision Report

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:

- *Aboriginal Heritage Act 1972* (AH Act)
- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999*

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that:

- Previously cleared/disturbed areas will be prioritised to ensure the clearing of native vegetation is minimised where possible.
- Weed control activities are undertaken on an as needs basis to control outbreaks. Weed management will be managed through the Environment and Heritage Impact Approval process on a project by project basis.
- One of the vegetation types delineated within the application area is considered to be of local importance: S3 (Mid sparse *Duma florulenta* shrubland). This vegetation was identified as having affinities to the Priority 3 Emu Land System Priority Ecological Community (PEC) and occurs across a small portion in the north-west corner of the smelter area within the application area. While this vegetation type occurs beyond the application area in the immediate surrounds, due to its local importance the applicant is committing to avoiding this vegetation type, as much as practical.
- All future development activities will comply with the AH Act (and any superseding legislation).

The applicant commissioned Biologic Environmental Survey to undertake a:

- single-season reconnaissance flora and vegetation survey and a single-season basic vertebrate fauna survey at their Kalgoorlie Nickel Smelter operations; and
- a targeted flora and fauna survey of proposed pipeline and road alignment corridors (BHP Nickel West Pty Ltd, 2022).

The Delegated Officer was 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

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values (fauna and vegetation) and land resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

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

Assessment

According to available databases, there are four records of fauna of conservation significance within the local area, being: arid bronze azure butterfly (*Ogyris subterrestris petrina*), Grey-tailed tattler (*Tringa brevipes*), desert blue butterfly (*Jalmenus aridus*) and Malleefowl (*Leipoa ocellata*).

A vertebrate fauna survey was undertaken of the majority of the Smelter Area and road corridor application areas. The survey identified four naturally occurring fauna habitats including: Open *Eucalypt* Woodland, *Allocasuarina* Shrubland, Low Chenopod Shrubland and Claypan. All fauna habitat types, are common throughout the local area and throughout the surrounding region. These habitat types are considered to be of low or moderate significance for vertebrate fauna species as they are widespread in the surrounding landscape and/or are not exclusively relied upon by species of conservation significance (Biologic, 2021).

The vertebrate fauna survey identified suitable habitat for a number of fauna species on conservation significance including the malleefowl and grey tailed tattler discussed above. In addition, suitable habitat for the common sandpiper (*Actitis hypoleucos*) (MI), fork-tailed swift (*Apus pacificus*) (MI) sharp-tailed sandpiper (*Calidris acuminata*) (MI), common greenshank (*Tringa nebularia*) (MI), wood sandpiper (*Tringa glareola*) (MI), red-necked stint (*Calidris ruficollis*) (MI), glossy ibis (*Plegadis falcinellus*) (MI) and peregrine falcon (*Falco peregrinus*) (OS) was identified (Biologic, 2021). These species are coastal and/or waterbirds that have widespread and a diverse range of habitats. Whilst suitable habitat maybe present for these species within the application area, it is considered that abundant suitable habitat is present within the local area and no loss of significant habitat for these species will result from the proposed clearing.

The arid bronze butterfly is listed as critically endangered under the BC Act and EPBC Act and has been recorded within 160 metres of the road corridor area of the application area. This species is known from two extant subpopulations in Western Australia at Barbalin Nature Reserve and a second approximately 100 kms from the Barbalin Nature reserve population. A third subpopulation occurred near Lake Douglas, 12 kilometres south west of Kalgoorlie, however is now considered locally extinct and no individuals have been recorded there since 1993 (DBCA, 2020). Therefore this species is not likely to occur within the application area.

The Priority 1 desert blue butterfly is known from a handful of records near Kalgoorlie. The species is not commonly collected and is poorly represented in Australian research collections. The larvae of this butterfly feed on the leaves and flowers of *Senna* spp. and *Acacia tetragonophylla* (Graham and Moulds, 1988). Both *Senna* spp. and *Acacia tetragonophylla* have been recorded within the application area, however the habitats representing these species are well represented in the local area. The proposed clearing is not likely to have a significant impact to these habitats and the conservation status of the butterfly is unlikely to be impacted.

The Grey-tailed tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayment's, estuaries and coastal lagoons, especially fringed with mangroves (Department of the Environment, 2022). Therefore this species is not likely to occur within the application area.

The malleefowl is listed as vulnerable under both the BC Act and EPBC Act. The malleefowl is found principally in the semi-arid to arid zone in shrubland and low woodlands dominated by mallee and associated habitats. In Western Australia they are also found in some shrublands dominated by acacia, and occasionally in woodlands dominated by eucalypts (Benshemesh, 2007). The majority of the application area was surveyed on foot to search for vertebrate fauna species of significance and their habitat including observation of nesting mounds of malleefowl. A single historical mound was identified within the *Allocasuarina* Shrubland habitat of the Survey Area (Biologic, 2021). No further evidence of the species was recorded, suggesting malleefowl are not currently utilising the Survey Area. Given the above, suitable habitat for this species is located within the application area. Given that malleefowl do not appear to be utilising the application area currently and that the local area is highly vegetated and likely to provide suitable habitat, no loss of significant habitat for this species is expected. Fauna management practices will ensure no direct impact to this species or active mounds occurs during clearing activities.

Conclusion

Based on the above assessment, the proposed clearing may result in impacts to malleefowl habitat. It is considered that the impacts of the proposed clearing on malleefowl habitat can be managed by searching for malleefowl mounds prior to clearing and undertaking slow directional clearing to allow malleefowl to move into adjacent vegetation.

Conditions

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

- Slow directional clearing to allow malleefowl and other fauna to move into adjacent vegetation ahead of the clearing activity and minimise impact to individuals.
- Requiring a fauna specialist to search for active malleefowl mounds prior to clearing will ensure that no impacts to significant breeding habitat will occur.

3.2.2. Biological values (flora and vegetation) - Clearing Principle (a)

Assessment

According to available databases, nine flora of conservation significance have been recorded within the local area, comprising of Priority 1, two Priority 2, five Priority 5 and one Priority 4 taxa (Western Australian Herbarium, 1998-). None of these records occur over the application area.

A flora and vegetation survey was conducted over the majority of the Smelter Area and road corridor by Biologic in September 2021 (Biologic, 2021). The survey included targeted search of conservation significant flora potentially occurring within the Survey Area, including traversing the application area along the road corridor area and smelter area. The survey recorded a total of 114 vascular flora taxa within the Smelter survey area.

No conservation significant flora were recorded within the survey area (Smelter area and road reserve). Given no conservation significant flora species were identified, the proposed clearing is not likely to impact upon threatened or priority flora.

No threatened or priority ecological communities have been mapped within the application area. Seven vegetation types were mapped within the smelter Survey Area. These vegetation types are described in Appendix A. The flora and vegetation survey identified that the area mapped as vegetation type S3 (Mid sparse *Duma florulenta* shrubland) shared affinities to a PEC, Emu Land System (P3). This vegetation type contained lignum (*Duma florulenta*), and scattered herbs and grasses fringed by *Melaleuca lateriflora*, and was situated on a small claypan landform. Vegetation type S3 cannot represent this PEC based on geographical distribution (i.e. it does not occur on the Emu Land System). However, it is considered to share affinities with the PEC due to its superficial similarity in landform and vegetation structure (a claypan containing lignum and scattered herbs and grasses (chiefly *Eragrostis* spp.), with fringing paperbark shrublands). Therefore this vegetation type is considered to represent vegetation of other significance at a local level due to its limited representation within the Survey Area (Biologic, 2021).

From aerial imagery, it appears that additional clay pans are present immediately outside of the application area, and therefore it is likely this vegetation type is represented outside of the application area. Approximately 0.8 hectares of the application area is mapped as this vegetation type and occurs in the north west corner of the Smelter Area. The applicant proposes to clear up 158 ha within the Smelter Area (within a 633 ha footprint) and the applicant has advised that it intends to avoid this vegetation type as much as practical. Therefore, the proposed clearing is not likely to have a significant impact on this vegetation community. The clearing proposed may indirectly impact this vegetation community through the spread of weeds.

Conclusion

Based on the above assessment, the proposed clearing may impact on a vegetation type of local significance and adjacent vegetation. It is considered that the impacts of the proposed clearing on vegetation type S3 and adjacent vegetation can be managed by taking steps to minimise the risk of the introduction and spread of weeds. The proposed clearing does not constitute a significant residual impact.

Conditions

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

- Avoid, minimise, and reduce impacts and extent of clearing
- Weed management

3.2.3. Land and water resources (land degradation) - Clearing Principle (g)

Assessment

As referred to in Appendix A, three soils types have been mapped within the application area. The mapped soils are moderately to highly susceptible to wind and water erosion, nutrient export, waterlogging and salinity.

The desktop assessment and aerial imagery indicated that three minor non-perennial watercourses intersect the eastern boundary of the application area. One area subject to inundation is located in the north west corner of the Smelter Area. An additional area subject to inundation, four non-perennial watercourses and three non-perennial lakes have been mapped within the road corridor area.

Only a small portion of the Smelter Area intersects with a watercourse or area subject to inundation and the road corridor is narrow and linear and will only impact a small area associated with a watercourse or area subject to inundation. It is considered that the proposed clearing is not likely to cause appreciable land degradation in the form of water erosion.

Given the purpose of clearing, that the proposed clearing of 231 ha occurs within a larger footprint of 705.8 ha and that the surrounding areas are highly vegetated, the proposed clearing is not likely to cause appreciable land degradation in the form of nutrient export, waterlogging and salinity.

Large areas cleared within the Smelter Area application area that remain bare for an extended period of time have the potential to cause appreciable land degradation in the form of wind erosion. Management practices will help mitigate this risk. The road corridor is narrow and linear and clearing within this area is not likely to cause wind erosion due to standard road management practices and construction methodologies.

Conclusion

Based on the above assessment, the proposed clearing may result in appreciable land degradation in the form of wind erosion. For the reasons set out above, it is considered that the impacts of the proposed clearing on land degradation can be managed by staged clearing and rehabilitation of temporary cleared areas.

Conditions

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

- Smelter and road construction activities to occur within three months of undertaking clearing to reduce the impacts of wind erosion.
- Revegetation and rehabilitation activities for temporary works to reduce the risk of exposed soils.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Development approval under the *Planning and Development Act 2005* (issued by the Shire of Kalgoorlie Boulder):
 - Application No. P083/18, P084/18, P085/18 was determined on 19 September 2018 and authorised the construction of the Flash Drier for nickel concentrate at Kalgoorlie Nickel Smelter (NKS). Development
 - Application No. P120/21 was determined on 27 July 2021 and authorised the construction of an Oxygen Production Plant to support nickel smelting at NKS.
- Licence issued under Part V Division 3 of the EP Act: Licence L8653/2012/2 authorises emissions and discharges resulting from NKS operations. The licence was amended 14 August 2017 (2012/003930) to authorise BHP Nickel West to process waste oil.

Several Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the AH Act and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of the assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B.

A.1 Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared occurs within a 705.8 hectare footprint area predominantly surrounding the existing Kalgoorlie Nickel Smelter and along the existing road between the smelter and Goldfields Highway. The vegetation is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is adjacent to existing vegetation as well the existing smelter infrastructure and access road.</p> <p>Aerial imagery indicates the local area (10 kilometre radius from the centre of the area proposed to be cleared) retains approximately 95 per cent of the original native vegetation cover.</p>
Ecological linkage	No ecological linkages have been mapped or are present within the application area.
Conservation areas	No conservations areas are located within the application area. Kurrawang Nature Reserve is located approximately one km north west of the application area. Lakeside Timber Reserve is located approximately 6.9 km east of the application area.
Vegetation description	<p>The reconnaissance flora and vegetation survey (Biologic 2021) indicates the vegetation within the proposed clearing area consists of the following seven vegetation types:</p> <p>Eucalypt Woodlands (E)</p> <ul style="list-style-type: none"> • E1 - Mid <i>Eucalyptus salubris</i> and <i>Eucalyptus salmonophloia</i> woodland; • E2 - Low open <i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i> and <i>Eucalyptus longissima</i> mallee woodland; • E3 - Low open <i>Eucalyptus torquata</i> mallee woodland; • E4 - Low open <i>Eucalyptus griffithsii</i>, <i>Eucalyptus longissima</i> and <i>Eucalyptus lesouefii</i> mallee woodland. <p>Shrublands (S)</p> <ul style="list-style-type: none"> • S1 - Tall <i>Allocasuarina helmsii</i>, <i>Acacia acuminata</i> and <i>Acacia tetragonophylla</i> shrubland; • S2 - Mid to low open <i>Lycium australe</i>, <i>Frankenia</i> sp., <i>Maireana sedifolia</i>, <i>Atriplex nummularia</i>, <i>Atriplex vesicaria</i> and <i>Sclerolaena diacantha</i> mixed chenopod shrubland; and • S3 - Mid sparse <i>Duma florentia</i> shrubland (Biologic 2021). <p>The full survey descriptions and maps are available in Appendix D.</p> <p>This is consistent with the broad mapped vegetation types:</p> <ul style="list-style-type: none"> • Beard vegetation association 9, which is described as medium woodland; coral gum (<i>Eucalyptus torquata</i>) and goldfields blackbutt (<i>E. le soufii</i>); • Beard vegetation association 1294, which is described as medium woodland; coral gum (Shepherd et al, 2001); and • Beard vegetation association 123, which is described as saltbush and/or bluebush with scattered low trees (Shepherd et al, 2001). <p>The mapped vegetation types retain approximately 96 - 98 per cent of the original extent (Government of Western Australia, 2019).</p>

Characteristic	Details
Vegetation condition	<p>The reconnaissance flora and vegetation survey (Biologic, 2021) identified that the vegetation within the proposed clearing area to be in an excellent to completely degraded (Keighery, 1994), with the majority of the vegetation in a very good condition (Keighery, 1994).</p> <p>The road corridor Survey Area mostly contained previously cleared roads, access tracks, railway and pipeline excavated soil, rather than intact vegetation (Biologic, 2021).</p> <p>The full condition rating scale is provided in Appendix C. The full survey descriptions and mapping are available in Appendix D.</p>
Climate and landform	<p>The annual average rainfall is approximately 300 millimetres. Evapotranspiration over the application area is approximately 300 millimetres. The geology mapped over the application area is characterised by metamorphosed sedimentary and acid volcanic rocks and metamorphosed basic and ultrabasic volcanic and intrusive rocks. The groundwater salinity within the application area typically ranges from approximately 1400 to more than 35 000 milligrams per litre total dissolved solids.</p>
Soil description	<p>The soil is mapped as the following soil types:</p> <ul style="list-style-type: none"> • BB5 which is described as Rocky ranges and hills of greenstones-basic igneous rocks; • Mx43 which is described as gently undulating valley plains and pediments; some outcrop of basic rock; and • SV15 which is described as salt lakes and their associated areas (DPIRD, 2017).
Land degradation risk	<p>The soils mapped within the application area have a high to extreme risk for wind and water erosion, waterlogging and phosphorus export.</p> <p>The degradation risk factors mapped over the application area are detailed in section A.5.</p>
Waterbodies	<p>The desktop assessment and aerial imagery indicated that three minor non-perennial watercourses intersect the eastern boundary of the Smelter Area application area. One area subject to inundation is located in the north west corner of the Smelter Area application area.</p> <p>An additional area subject to inundation, four non-perennial watercourses and three non-perennial lakes have been mapped within the Road Corridor application area.</p> <p>There are no permanent watercourses within or associated with the application area.</p>
Hydrogeography	<p>The application area is mapped within the Goldfields Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i>.</p>
Flora	<p>There are nine priority flora species recorded within the local area, of which no suitable habitat features are likely to be located within the application area.</p> <p>A targeted flora survey was undertaken within the application area and no threatened or priority flora were recorded (Biologic, 2021).</p>
Ecological communities	<p>No threatened or priority ecological communities have been recorded within the local area.</p> <p>A Reconnaissance Flora and Vegetation Survey did not identify any threatened or priority ecological communities within the application area (Biologic, 2021).</p>

Characteristic	Details
Fauna	There are four records of fauna of conservation significance within the local area. A fauna habitat survey identified one inactive mallefowl (<i>Leipoa ocellata</i>) mound within the application area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Coolgardie	12,912,204.35	12,648,491.39	97.96		16.37
Vegetation complex					
Beard vegetation association 9 *	97.78	97.78	97.78	8.07	7.90
Beard vegetation association 1294	6,295.55	6,047.45	96.06	1.90	1.83
Beard vegetation association 123	9,090.22	8,902.02	97.93	-	-

*Government of Western Australia (2019)

A.3 Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil 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]
<i>Ptilotus procumbens</i>	P1	N	N	N	8.1	1	Y
<i>Eremophila praecox</i>	P2	N	Y	Y	3	4	Y
<i>Goodenia salina</i>	P2	N	Y	Y	1.8	1	Y
<i>Alyxia tetanifolia</i>	P3	N	Y	Y	1.5	4	Y
<i>Isolepis australiensis</i>	P3	N	Y	Y	1.8	1	Y
<i>Melaleuca coccinea</i>	P3	N	N	Y	8.1	1	Y
<i>Notisia intonsa</i>	P3	N	Y	Y	1.2	1	Y
<i>Xanthoparmelia dayiana</i>	P3	N	N	N	2.5	1	Y
<i>Eucalyptus jutsonii</i> subsp. <i>Jutsonii</i>	P4	N	Y	Y	1.7	1	Y

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

A.4. 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]
Arid bronze azure butterfly (<i>Ogyris subterrestris petrina</i>)	CR	Y	Y	0.16	16	N
Grey-tailed tattler (<i>Tringa brevipes</i>)	P4	N	N	0	1	Y
Inland hairstreak, desert blue butterfly (<i>Jalmenus aridus</i>)	P1	Y	Y	2.2	5	N
Malleefowl (<i>Leipoa ocellata</i>)	VU	Y	Y	2.2	3	Y

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

A.5. Land degradation risk table

Risk Categories	BB5	Mx43	SV15
Wind erosion	High to extreme hazard	High to extreme hazard	High to extreme hazard
Water erosion	Very high to extreme hazard	Very high to extreme hazard	Very high to extreme hazard
Waterlogging	Moderate to Very High risk	Moderate to very high risk	Moderate to very high risk
Subsurface acidification	0% of soil unit has a high susceptibility	0% of soil unit has a high susceptibility	0% of soil unit has a high susceptibility
Phosphorus export	High to Extreme hazard	High to extreme hazard	High to extreme hazard
Salinity risk	Moderate hazard	Moderate hazard	Moderate hazard
Flooding	Moderate to High hazard	Moderate to High Hazard	Moderate to high hazard

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain suitable habitat for conservation significant fauna and comprises vegetation representative of a restricted ecological community.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared may contain suitable habitat for conservation significant fauna.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for threatened flora given the lack of records within the local area and that no species were identified in the flora and vegetation survey undertaken within the application area.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that indicate a threatened ecological community (TEC). No TECs have been mapped within the local area. A flora and vegetation survey did not identify any TECs located within the application area (Biologic, 2021).</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“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></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (f)</u>: <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment</u>:</p> <p>Given a number of non-perennial watercourses and areas subject to inundation are recorded within the application area, the proposed clearing is considered to be growing in association with a watercourse or wetland.</p> <p>However, the clearing of 235 hectares of native vegetation within a footprint of 705.8 hectares, of which 73 hectares occurs along a narrow linear area approximately 14 km in length, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality or significantly impact the watercourses.</p>	At variance	No
<p><u>Principle (g)</u>: <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment</u>:</p> <p>The mapped soils are moderately to highly susceptible to wind and water erosion, nutrient export, waterlogging and salinity. The proposed clearing may cause appreciable land degradation.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (i)</u>: <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.”</i></p> <p><u>Assessment</u>:</p> <p>A number of watercourses and areas subject to inundation are recorded within the application area and the proposed clearing may temporarily impact surface water quality through surface water runoff and sedimentation. However, given the extent (231 ha of clearing) within a larger footprint area and that 73 hectares is proposed along a narrow linear area, the proposed clearing is unlikely to impact surface water quality.</p> <p>The surrounding areas are highly vegetated and the clearing of 231 hectares within a larger footprint area is not likely to impact upon ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j)</u>: <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment</u>:</p> <p>The soils mapped within the application area are susceptible to waterlogging and flooding. However, given the extent of clearing within a larger footprint area and that the local area is highly vegetated, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.</p>	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 its location, 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. Biological survey information excerpts

D.1. Flora , vegetation and fauna survey

Overview

A comprehensive flora, vegetation and vertebrate fauna desktop assessment comprising of database searches and literature review was undertaken for the Survey Area. The Survey area covers the majority of the application area however 35 hectares located within the north east corner of the Smelter Area application area was not included in the desktop assessment or the field survey included within the flora, vegetation and fauna survey.

The field survey, which comprised a total of 25 relevé sites, 11 mapping notes and 22 fauna habitat assessments, was completed over three days between the 8th and 10th of September 2021.

Flora

A total of 114 vascular flora taxa from 31 families and 62 genera were recorded from the smelter Survey Area during the field survey (109 native taxa and five introduced taxa). Of the five introduced taxa; *Echium plantagineum* (Patterson's Curse) is a Declared Pest under Section 22 of the *Biosecurity and Agriculture Management Act*. *Eragrostis curvula* is on the priority list for weed management for the Goldfields Region due to it being currently absent from lands managed by the Department of Biodiversity, Conservation and Attractions.

No conservation significant flora taxa were recorded during this survey from the smelter or corridor Survey Area. *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2) is considered Possible to occur in the Survey Area following the post-survey likelihood assessment. All other conservation significant flora taxa are considered either Unlikely or Highly Unlikely to occur in the Survey Area.

Five flora taxa recorded from the smelter Survey Area by this survey are considered to be flora of "Other" significance:




- *Calandrinia pumila* – range extension 78 km southeast;
- *Centipeda crateriformis* subsp. *compacta* – fills a gap in distribution;
- *Lepidosperma* sp. indet – does not match any taxa currently held and described at the Western Australian Herbarium, most closely resembles *Lepidosperma* sp. Kambalda (A.A. Mitchell 5156) (P2);
- *Ptilotus obovatus* var. *obovatus* - range extension 141 km east-southeast; and
- *Swainsona purpurea* – range extension 17 km south.


Vegetation

Seven vegetation types were identified within the study area as referred to in the table below:

Table 1: Vegetation types

Veg Code	Veg code (BHP standard)	Broad Floristic Formation	Vegetation Description	Sample sites	Extent (ha/ %)	Significant Features	Condition	Representative photo
E1	FS EsEsa Ms SeaEExaEs AnsOmScsp	Eucalyptus Mid Woodland	Mid <i>Eucalyptus salubris</i> and <i>Eucalyptus salmonophloia</i> woodland over occasional dense patches of <i>Melaleuca sheathiana</i> shrubs over mid open <i>Senna artemisioides</i> subsp. <i>filifolia</i> , <i>Exocarpos aphyllus</i> and <i>Eremophila scoparia</i> over low open <i>Atriplex nummularia</i> subsp. <i>spatulata</i> , <i>Olearia muelleri</i> and <i>Scaevola spinescens</i> shrubland on mid and lower slopes and flats on brown clay loam with limited surface stones	KAL-09, KAL-07, KAL-08, KAL-18, KAL-19, KAL-22, KAL-26, KAL-27	173.2 / 28.5		Very Good, Degraded (E1(d))	
E2	HS EffeI EiSeaSaac HaSosp Ts	Eucalyptus Low Open Mallee Woodland	Low open <i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i> and <i>Eucalyptus longissima</i> mallee woodland over tall open <i>Eremophila interstans</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Santalum acuminatum</i> shrubland over mid to low open <i>Halgania andromedifolia</i> and <i>Scaevola spinescens</i> shrubland over low open <i>Triodia scariosa</i> hummock grassland on mid slopes on red/brown sandy clay loam with limited surface stones	KAL-13 (mapping note), KAL-16	17.8 / 2.9		Excellent, Very Good	
E3	HS Et Ab SospAsWr Ts	Eucalyptus Low Open Mallee Woodland	Low open <i>Eucalyptus torquata</i> mallee woodland over tall sparse <i>Alyxia buxifolia</i> shrubland over mid to open low <i>Scaevola spinescens</i> , <i>Acacia erinacea</i> and <i>Westringia rigida</i> shrubland over occasional patches of <i>Triodia scariosa</i> hummock grasses on rocky (calcrete pebbles) upper and mid slopes on red/brown sandy clay loam	KAL-21, mapping notes	10.7 / 1.8		Excellent, Very Good	

Veg Code	Veg code (BHP standard)	Broad Floristic Formation	Vegetation Description	Sample sites	Extent (ha/ %)	Significant Features	Condition	Representative photo
E4	SP EgEIEle Ms SospSeaf WrHa Ts	Eucalyptus Low Open Mallee Woodland	Low open <i>Eucalyptus griffithii</i> , <i>Eucalyptus longissima</i> and <i>Eucalyptus leouefii</i> mallee woodland over occasional dense patches of <i>Melaleuca sheathiana</i> shrubs over mid open <i>Scaevola spinescens</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> shrubland over low open <i>Westringia rigida</i> and <i>Halgania andromedifolia</i> shrubland over occasional patches of <i>Triodia scariosa</i> hummock grasses on plains and flats on red/brown sandy clay loam with limited surface stones	KAL-04, KAL-10 (mapping note), KAL-11, KAL-12, KAL-17, KAL-24, KAL-28, KAL-34	151.7 / 25.0		Very Good, Degraded (E4(d))	
S1	HC AhAte SospPFPs EtEgEi Ts	Allocasuarina Tall Shrubland	Tall <i>Allocasuarina helmsii</i> , <i>Acacia acuminata</i> and <i>Acacia tetragonophylla</i> shrubland over mid open <i>Scaevola spinescens</i> , <i>Pomaderris forrestiana</i> and <i>Prostanthera incurvata</i> shrubland with low isolated <i>Eucalyptus torquata</i> , <i>Eucalyptus griffithii</i> and <i>Eucalyptus longissima</i> mallee trees over occasional patches of <i>Triodia scariosa</i> hummock grasses on rocky (dolerite and calcrete pebbles) hill tops (crests) and upper hill slopes on red sandy clay loam	KAL-14, KAL-15, KAL-20, KAL-29, KAL-31	30.2 / 5.0		Excellent	
S2	SF LaFsMseAmAvSodi	Chenopod Mixed Low Open Shrubland	Mid to low open <i>Lycium australe</i> , <i>Frankenia</i> sp., <i>Maireana sedifolia</i> , <i>Atriplex nummularia</i> , <i>Atriplex vesicaria</i> and <i>Sclerolaena diacantha</i> on saline flats and floodplains on orange clay loam	KAL-02, KAL-05	40.3 / 6.6		Very Good, Degraded (S2(d))	

Veg Code	Veg code (BHP standard)	Broad Floristic Formation	Vegetation Description	Sample sites	Extent (ha/ %)	Significant Features	Condition	Representative photo
S3	GP Duf MI	Duma Mid Sparse Shrubland	Mid sparse <i>Duma florulenta</i> shrubland with scattered fringing <i>Melaleuca lateriflora</i> shrubs over scattered herbs and grasses on claypans and depressions on red/brown clay	KAL-01	0.8 / 0.1	Shares affinities with Emu Land System PEC	Good	
CI	CI	Cleared	Cleared	-	182.3 / 30.0		Completely Degraded	

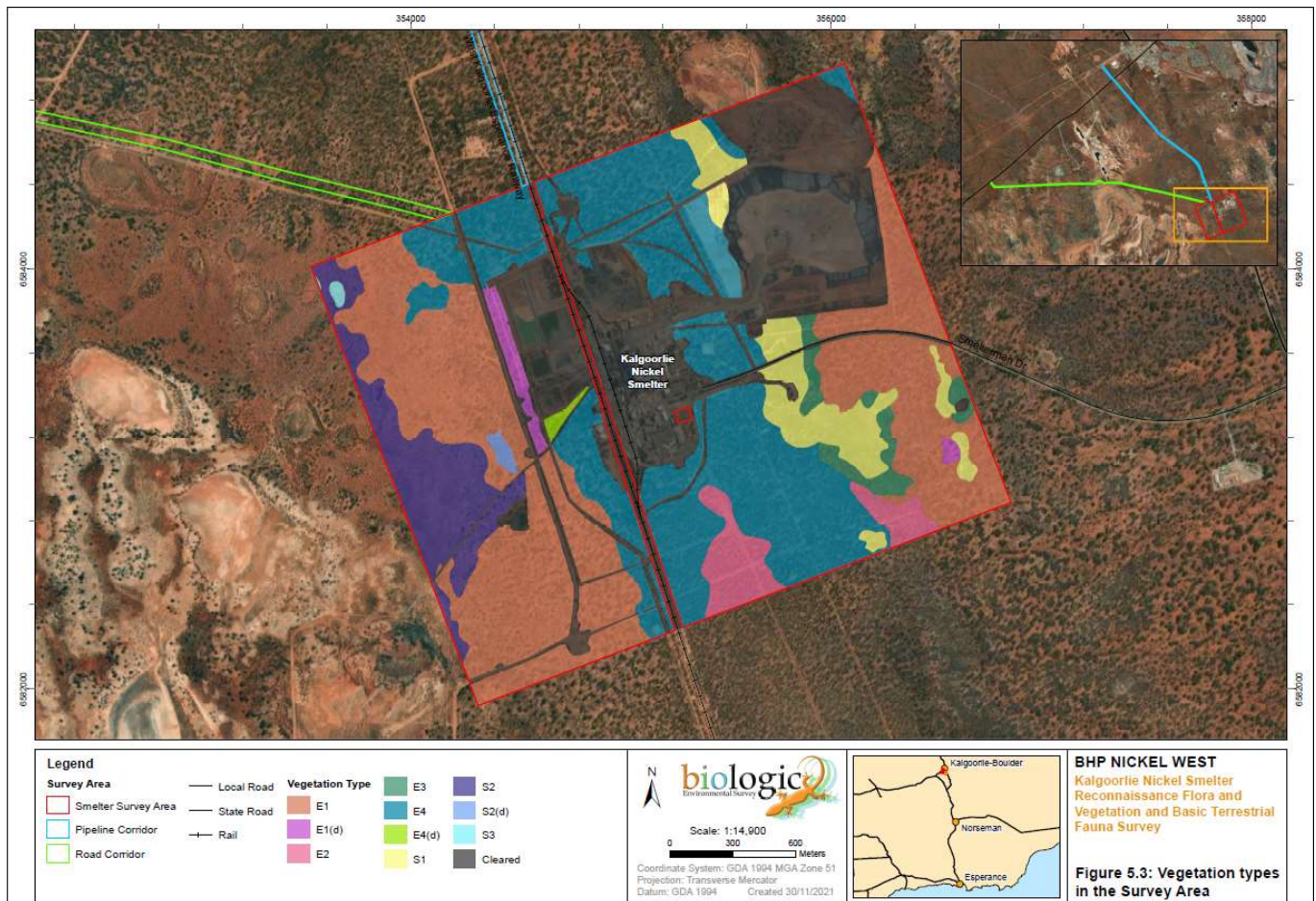


Figure 4: Vegetation types in the Survey Area

Vegetation Condition

The condition of the vegetation within the smelter Survey Area ranged from completely degraded (cleared areas) to excellent, with the majority of the vegetation in very good condition (Table 5.7, Figure 5.4). The main disturbances observed were associated with mining/ exploration (proximity to smelter), roads and tracks, and weed invasion. There were signs of stock grazing and trampling across most small portions of the smelter Survey Area confined to the floodplains, saline flats and claypan landforms (vegetation types S2 and S3) that resulted in a low condition rating. Generally weed cover was low, with only sporadic occurrences through the smelter Survey Area.

Table 2: vegetation condition in the Smelter Area

Condition	Extent (ha / %)	Comment
Excellent	58.7 / 9.7	Generally occurred on landforms higher in the landscape (mid to upper slopes, hilltops/crests – vegetation types S1, E2 and E3). Minimal disturbances noted, mainly to do with historical clearing and nearby tracks/ roads.
Very Good	356.7 / 58.8	Occurred across majority of the smelter Survey Area and showed only minimal signs of disturbances associated with mining/ exploration (proximity to smelter).
Good	2.3 / 0.4	Occurred across small portions of the smelter Survey Area and showed evidence of stock trampling and grazing, as well as some weed presence. Mainly occurred on landforms low in the landscape with higher moisture retention (floodplains, saline flats and claypan landforms – vegetation types S2 and S3).
Degraded	7.0 / 1.2	Confined to areas directly adjacent cleared areas close to the smelter. Main disturbances include clearing, dust, plant deaths and soil excavation.
Completely Degraded	182.3 / 30.0	Cleared areas (roads, tracks, drill pads, smelter infrastructure area).

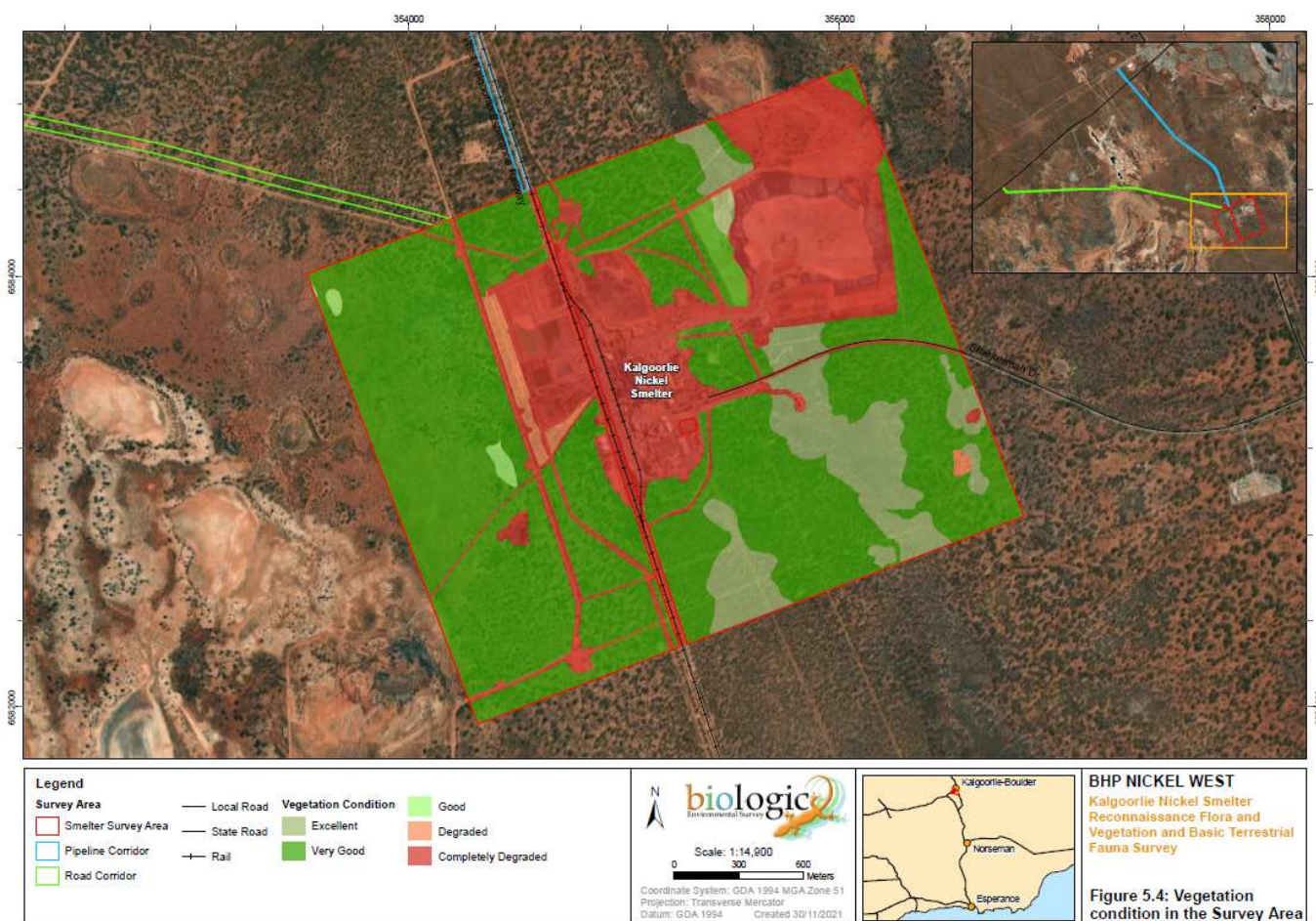


Figure 5: Vegetation condition in the Survey Area





Fauna Habitat

Fauna habitat assessments were completed for each of 22 sites with habitat mapping subsequently completed for the Smelter Area. Four broad fauna habitat types were identified within the Smelter Area, together with a large area that is completely Cleared/ Disturbed. The four fauna habitats were, in decreasing order of extent, Open *Eucalypt* Woodland, *Allocasuarina* Shrubland, Low Chenopod Shrubland, and Claypan.

The road corridor Survey Area was not subjected to vegetation or habitat mapping during this survey, however, the interpretation of pre-european vegetation alongside the habitat mapping undertaken within the smelter Survey Area can provide suppositions on the habitat contained within the corridor Survey Area. Each corridor is affected by cleared or disturbed areas related to existing roads and infrastructure. The road corridor to the east traverses four

vegetation associations also represented within the smelter Survey Area (Coolgardie_9, Coolgardie1294, Coolgardie_123 and Coolgardie_125) and as such is likely to contain all four habitat types associated with the vegetation associations respectively (Open *Eucalypt* Woodland, *Allocasuarina* Shrubland, Open Chenopod Shrubland and Claypan). The pipeline corridor to the north traverses primarily Coolgardie_9 vegetation association which is associated with Open Eucalypt Woodland, with some potential for the occurrence of *Allocasuarina* Shrubland (Coolgardie_1294) and Open Chenopod Shrubland (Coolgardie_123).

Table 2: Broad fauna habitat types identified within the Survey Area

Habitat	Distinguishing features	Local and Regional Extent	Representative photo
<p>Open Eucalypt Woodland</p> <p>Extent in Survey Area: 353.4 ha (58.2%)</p>	<p><i>Eucalyptus griffiths</i> and <i>E. trichopoda</i> woodland over <i>Senna</i> shrubland, sparse understorey. Fallen branches and bark piles, some logs and hollows present. The understorey vegetation may provide shelter and nesting habitat for ground dwelling birds.</p>	<p>Open Eucalypt Woodland is broadly associated with land system Mx43 (gently undulating plains and pediments with some outcropping) and Vegetation Association Coolgardie_9 (Shepherd <i>et al.</i>, 2002), which are wide spread in the surrounding area and bioregion (Figure 2.2, Figure 2.6).</p>	
<p>Allocasuarina Shrubland</p> <p>Extent in Survey Area: 30.2 ha (5.0%)</p>	<p>Characterised by a tall dense shrubland dominated by <i>Allocasuarina helmsii</i>, <i>Acacia acuminata</i> and <i>Acacia tetragonophylla</i> tall shrubs over sand or rocky substrates. This habitat contains scattered larger trees and mallees. The understorey vegetation may provide shelter and nesting habitat for ground dwelling birds.</p>	<p>Allocasuarina Shrubland habitat is closely associated with the Pre-European mapping extent of Coolgardie_1294 (Figure 2.6). This particular vegetation association is limited to 11 linear bands within the local (40km) region.</p>	
<p>Low Chenopod Shrubland</p> <p>Extent in Survey Area: 40.3 ha (6.6%)</p>	<p>Low dense shrublands with scattered grasses. Provides shelter for bird and mammal species of conservation significance with possible nesting habitat and proximity to water sources for foraging, seasonally when inundated.</p>	<p>Low Chenopod Shrubland is broadly associated with land system SV15 and Vegetation Association Coolgardie_123 (Shepherd, 2002 #5083), which are common in the surrounding local area and bioregion in association with salt lakes and claypans (Figure 2.2, Figure 2.6).</p>	
<p>Claypan</p> <p>Extent in Survey Area: 0.8 ha (0.1%)</p>	<p>Open low-lying claypans and flats with scattered shrubs and grasses. Inundated seasonally following rains providing foraging habitat for waterbird and migratory bird species.</p>	<p>Claypan fauna habitat is broadly associated with land system SV15 and Vegetation Association Coolgardie_125 (Shepherd, 2002 #5083), which are common in the surrounding local area and bioregion in association with low relief plains and salt lakes (Figure 2.2, Figure 2.6).</p>	
<p>Cleared/ Disturbed</p> <p>Extent in Survey Area: 182.3 ha (30.0%)</p>	<p>Distinguished by the absence or severe reduction in vegetation and high levels of disturbance activities.</p>	<p>NA</p>	<p>NA</p>

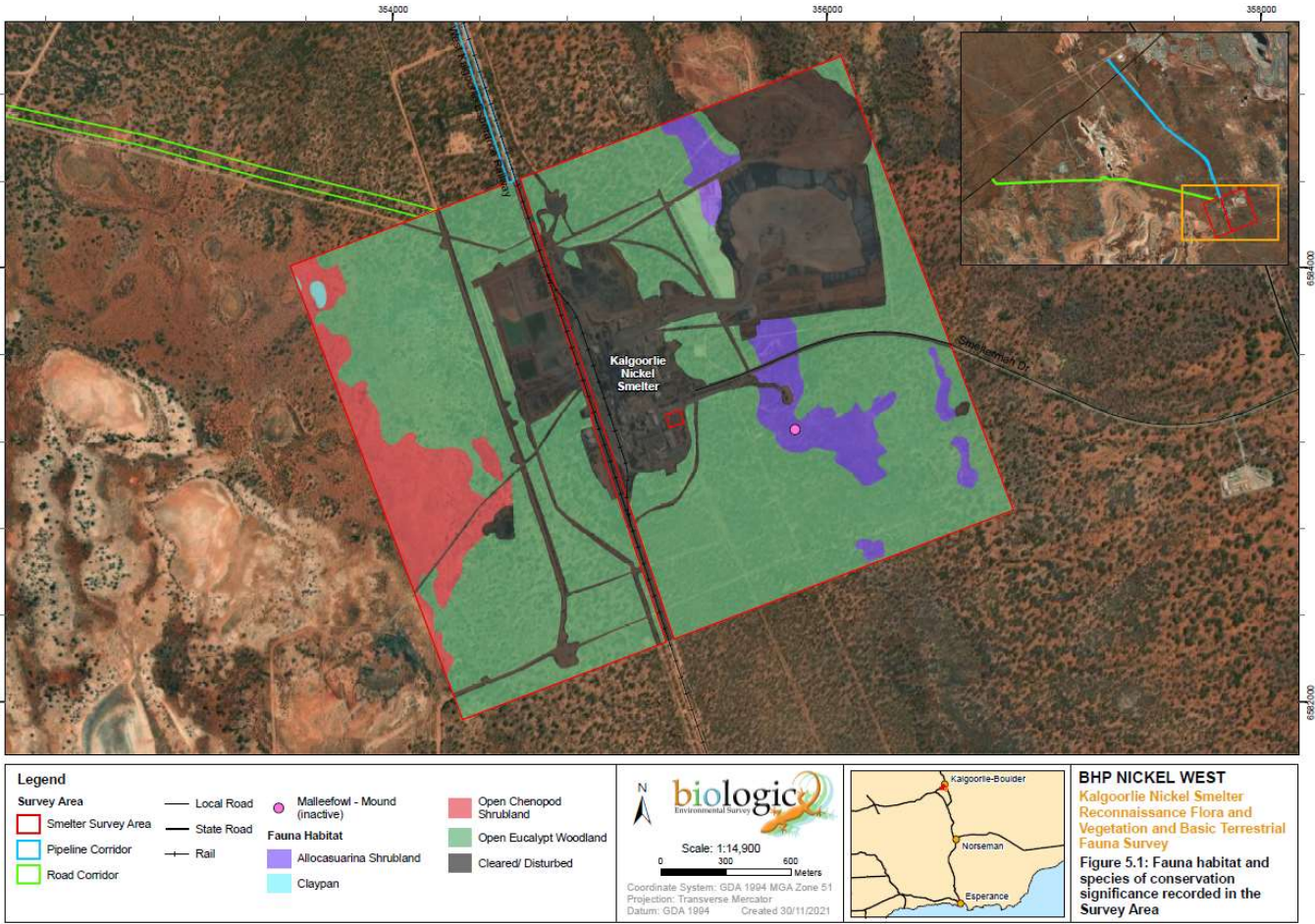


Figure 6: Fauna habitat and species of conservation significance recorded in the Survey Area

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

E.2. References

BHP Nickel West Pty Ltd (2022) *Clearing permit application CPS 9556/1*, received 5 January 2022 (DWER Ref: DWERDT546989).

BHP Nickel West Pty Ltd (2022) *Supporting information for clearing permit application CPS 9556/1*, received 5 January 2022 (DWER Ref: DWERDT562563).

Biologic (2021) *Kalgoorlie Nickel Smelter, Reconnaissance Flora and Vegetation Survey and Basic Terrestrial Fauna Survey*. Western Australia. DWERDT562554

- Benshemesh, J. (2007). National Recovery Plan for Malleefowl. Department for Environment and Heritage, South Australia.
- Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2020) *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia*. Department of Biodiversity, Conservation and Attractions, Western Australia.
- Department of Environment Regulation (DER) (2013). *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 Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed May 2022).
- Department of the Environment (2022) *Tringa brevipes* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>.
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- 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) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.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>
- Graham, A.J., and Moulds, M.S. (1988) A new species of '*Jalmenus hubner*' (Lepidoptera: Lycaenidae) from Western Australia. The Journal of the Entomological Society of New South Wales 20: 57- 62
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed May 2022)