



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9394/1
Permit type:	Purpose Permit
Applicant name:	Atlas Iron Pty Ltd
Application received:	16 August 2021
Application area:	40.72 hectares
Purpose of clearing:	Borrow pits
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 45/1282, Miscellaneous Licences 45/189, 45/285
Location (LGA area/s):	Shire of East Pilbara
Colloquial name:	Abydos Haul Road Project

1.2. Description of clearing activities

Atlas Iron Pty Ltd proposes to clear up to 40.72 hectares of native vegetation within a boundary of approximately 40.72 hectares, for the purpose of borrow pits.

The application is for the creation of borrow pits to allow the construction and maintenance of a haul road between the Miralga Creek satellite mine and the existing processing facility at the Abydos mine.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	28 January 2022
Decision area:	40.72 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 16 August 2021. DMIRS advertised the application for public comment for a period of 21 days, 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 a flora and vegetation survey (Appendix D), 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).

The assessment identified that:

- the clearing has the potential for the introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the clearing is not likely to have a significant impact on habitat for Priority flora species;
- the vegetation is not likely to represent significant habitat for fauna species;
- the clearing will impact several minor ephemeral drainage lines however, it will not impact surface water flow at a broad level.

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.

1.5. Site map

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

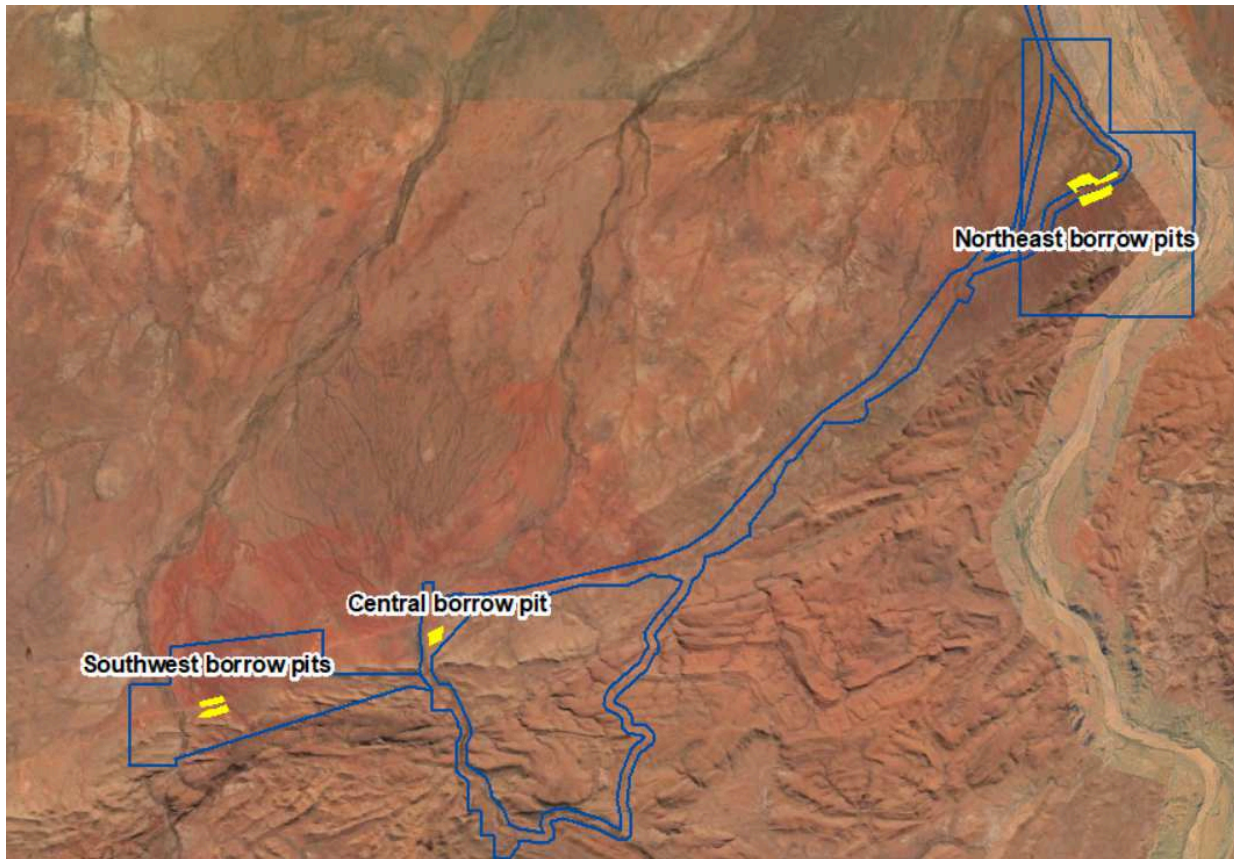


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

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 includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC 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 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

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. The location of the borrow pits have been sited adjacent to areas of existing approved disturbance and the clearing permit boundary has been reduced to the amount of clearing proposed.

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 identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora). 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 (flora) - Clearing Principle (a)

Assessment

The application area has been previously included in several flora and vegetation surveys (Onshore Environmental, 2021). The northeast and central borrow pits were included as part of the flora survey for the greater Miralga Creek project in 2019 (Woodman Environmental, 2019). Approximately 50% of the southern borrow pits were covered by a flora survey for the Abydos camp and haul road corridor in 2012 (Woodman Environmental Consulting, 2012). A review of the previous surveys has inferred the vegetation types within the areas not covered by surveys are the same as the adjacent areas mapped by the flora survey as they extend over the same landforms (Onshore Environmental, 2021).

The flora survey of the Miralga Creek area identified four vegetation types which may be considered to be regionally significant due to them being either restricted in the region or supporting unusual and significant species (Woodman Environmental, 2019). None of the vegetation types considered to be regionally significant were present within the application area (Onshore Environmental, 2019). The vegetation units mapped within the southwest borrow pits area were well represented in the survey area and occurred on landforms that are common and widespread (Onshore Environmental, 2021). In addition, no vegetation communities within the application area have been identified as being a Threatened or Priority Ecological Community.

The Miralga Creek flora survey recorded eight species of conservation significant flora:

- *Corchorus* sp. Yarrie (J. Bull & D. Roberts CAL 01.05) (Priority 1);
- *Eragrostis crateriformis* (Priority 3);
- *Euphorbia clementii* (Priority 3);
- *Euphorbia inappendiculata* var. *inappendiculata* (Priority 2);
- *Goodenia nuda* (Priority 4);
- *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3);
- *Triodia basitricha* (Priority 3); and
- *Triodia chichesterensis* (Priority 3).

The Abydos camp and haul road flora survey also recorded *Euphorbia clementii* along with *Eriachne* aff. *festucea* which is not a conservation significant species but could represent a new species (Woodman Environmental Consulting, 2012). None of the conservation significant species recorded during the previous flora survey were recorded within the application area (Onshore Environmental, 2021). Based on the suitability of the landforms and habitats present within the application area, it was considered that *Eragrostis crateriformis*, *Euphorbia clementii*, *Triodia chichesterensis* and *Goodenia nuda* may possibly be found within the application area (Onshore Environmental, 2021). All four of these species have a wide distribution across the Pilbara bioregion and the proposed clearing of 40.72 hectares of habitat is not likely to have a significant impact on these species (Western Australian Herbarium, 1998-).

The Miralga Creek flora survey recorded 20 introduced flora species (Woodman Environmental, 2019). Given the presence of drainage lines within the application area, it is likely that there are weed species present within the area (GIS Database). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on habitat for Priority flora is not likely to be significant. There is a high likelihood of weeds being present within the application area and the proposed clearing has the potential to exacerbate the spread of weeds.

Conditions

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

- Weed management measures will be required as a condition on the clearing permit.

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

Assessment

The application area has been previously included in several fauna surveys (Onshore Environmental, 2021). The northeast and central borrow pits were included as part of the fauna survey for the greater Miralga Creek project in 2019 (Biologic, 2020). The whole application area was covered by a survey undertaken for the Abydos East Link Road in 2012 (Outback Ecology Services, 2012).

Based on mapping from the Miralga Creek survey, the habitat within the northeast and central borrow pits is described as 'stony plain' (Biologic, 2020; Onshore Environmental, 2021). This habitat is broadly represented within the broader vicinity of the application area and was deemed to have a low significance as it supported few species of conservation significance and fauna species were not dependent on this habitat at a broad scale (Biologic, 2020). Based on the vegetation and landforms present, the southwest borrow pits were also inferred to contain the 'stony plains' habitat (Onshore Environmental, 2021). The Abydos East Link Road survey mapped the habitat within the whole application area as 'spinifex stony plain' which is described as stony plains supporting extensive *Triodia* hummock grasslands with scattered scrubs (Onshore Environmental, 2021; Outback Ecology Services, 2012). This was the most common habitat recorded during the 2012 fauna survey (Outback Ecology, 2012).

Based on the known records and results from previous surveys, there are two conservation significant fauna species which are associated with spinifex stony plains habitat; Western Pebble-mound Mouse (*Pseudomys chapmani* – Priority 4) and Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardti* – Priority 4) (Onshore Environmental, 2021). This habitat can offer large hummocks of spinifex which are important for the Spectacled Hare-wallaby and small evenly sized stones for the Western Pebble-mound Mouse to construct mounds (Onshore Environmental, 2021). This habitat was common throughout both survey areas and is well represented in the surrounding areas (Onshore Environmental, 2021). The proposed clearing may remove some habitat for these species however, it is not likely to have a significant impact at a local or regional level.

There are other fauna species of conservation significance which may also utilise the application area including the Northern Quoll (*Dasyurus hallucatus* – Endangered), Ghost Bat (*Macroderma gigas* – Vulnerable) and Pilbara Leaf-nosed Bat (*Rhinonictis aurantia* – Vulnerable) (Onshore Environmental, 2021; GIS Database). These species are likely to use this habitat for dispersal and foraging and are not likely to be reliant on habitat features within the application area.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing of fauna habitat within the application area is not likely to have a significant impact to fauna species in the local area.

Conditions

No specific fauna management conditions are required on the permit to address impacts to fauna.

3.3. Relevant planning instruments and other matters

There are two native title claims over the area under application (DPLH, 2022). These claims have been determined by the Federal Court on behalf of the claimant groups. 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 no registered Aboriginal Sites of Significance within the application area (DPLH, 2022). 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.

The Miralga Creek DSO project was assessed by the EPA and approved under Ministerial Statement 1154. The application area is not located within the approved development envelope for Ministerial Statement 1154.

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 application is located approximately 47 kilometres east, southeast of Marble Bar. The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is adjacent to the existing haul road for the Abydos project.
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages.
Conservation areas	The closest conservation area is the former Meentheena Pastoral Lease which is located approximately 84 kilometres east of the application area.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database):</p> <p>82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> 93: Hummock grasslands; shrub steppe; kanji over soft spinifex.</p> <p>The northeast and central borrow pits were covered by larger survey for the Miralga Creek project in 2019 (Woodman Environmental, 2019). Approximately 50% of the southwest borrow pits were intercepted by a flora survey conducted by Woodman Environmental in 2012. The vegetation in the areas not covered by a survey was extrapolated using aerial imagery and existing vegetation mapping (Onshore Environmental, 2021).</p> <p>The following vegetation associations were identified within the application area (Onshore Environmental, 2021):</p> <p>VT7: Open woodland of <i>Corymbia hamersleyana</i> and occasionally <i>Corymbia flavescens</i> or <i>Terminalia circumalata</i> over tall open shrubland to sparse shrubland of mixed Acacia species dominated by <i>Acacia tumida</i> var. <i>pilbarensis</i>, <i>Acacia acradenia</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> over low sparse shrubland of mixed species including <i>Corchorus parviflorus</i>, <i>Hybanthus aurantiacus</i> and <i>Indigofera monophylla</i> over sparse grassland and sparse hummock grassland of species including <i>Chrysopogon fallax</i>, <i>Eriachne tenuiculmis</i>, <i>Triodia epactia</i> and occasionally <i>*Cenchrus ciliaris</i> on minor drainage lines and plains on red-brown sandy loam to clay loam;</p> <p>VT10: Tall isolated shrubs of mixed Acacia species including <i>Acacia inaequilatera</i> and <i>Acacia bivenosa</i> with occasional isolated trees of <i>Corymbia hamersleyana</i> over hummock grassland dominated by <i>Triodia lanigera</i>, and occasionally <i>Triodia epactia</i>, <i>Triodia wiseana</i> and/or <i>Triodia brizoides</i> with isolated small shrubs on red-brown clay loam to sandy-clay loam on undulating plains, midslopes to crests of low gentle rises influenced by ironstone, granite, dolerite and occasionally calcrete;</p> <p>VT12: Isolated shrubs of mixed Acacia species over hummock grassland of <i>Triodia epactia</i> and occasionally <i>Triodia brizoides</i> on low rises and lower slopes on red-brown sandy loam with granite or ironstone influence;</p> <p>Vegetation Alliance 6a: <i>Corymbia hamersleyana</i> scattered low trees to low open woodland over tall shrubs to open shrubland of <i>Acacia</i> spp. and <i>Grevillea wickhamii</i> over hummock grasslands on creek banks, flood banks and distributing fans. This vegetation alliance was extensively mapped over the haul road corridor and camp areas; and</p> <p>Vegetation Alliance 12a: <i>Acacia inaequilatera</i> scattered tall shrubs to high open shrubland over <i>Triodia brizoides</i> hummock grasslands on ridge slopes and low hills. This vegetation alliance was mapped over a majority of the haul road corridor.</p> <p>*denotes weed species.</p>
Vegetation condition	<p>The vegetation surveys by Woodman (2012; 2019) indicate the vegetation within the proposed clearing area is in excellent to very good (Trudgen, 1991) condition.</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix C.</p>
Climate and landform	The application area is mapped within elevations of 140-200 metres AHD. The annual average rainfall (Marble Bar) is 391.8 millimetres (BoM, 2022).

Characteristic	Details
Soil description	The soil is mapped as Oc63 and Gf1 (GIS Database). The Oc63 soil unit is described as pediplains on granite usually occurring as a zone flanking the main stream courses: chief soils are hard alkaline red soils (Northcote et al., 1960-68). Gf1 is described as steep ranges on basic lavas along with dolomites, tuff, banded iron formations, and dolerite dykes, with some narrow valley plains and high-level gently undulating areas of limited extent. The soils are generally shallow and stony and there are large areas without soil cover: chief soils are brown loams along with significant areas of earthy loam soils (Northcote et al., 1960-68).
Land systems	The application area has been mapped as the Boolgeeda, Capricorn, Platform and Satirist land systems.
Waterbodies	The desktop assessment and aerial imagery indicated that several minor, non-perennial watercourses transect the area proposed to be cleared.
Hydrogeography	The application area is not within any legislated surface or groundwater areas. The mapped groundwater salinity is 500-1,000 milligrams per litre total dissolved solids which is described as marginal.
Flora	There has been no previous records of Threatened or Priority flora within the application area. Onshore Environmental (2021) undertook a review of flora surveys which have previously been undertaken that include the application area. Based on records from these surveys and the habitats present, there are three species of priority flora which were determined to be possible within the permit area.
Ecological communities	There are no mapped Priority or Threatened Ecological Communities within the local area (20 kilometre radius). The closest TEC or PEC is over 120 kilometres from the application area.
Fauna	According to available databases, three conservation significant fauna species have been recorded within the local area (20 kilometre radius). The most frequently recorded species is the Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>).

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

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> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains potential habitat for several species of Priority flora.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains habitat for the conservation significant fauna species Spectacle Hare-wallaby and Western Pebble-mound Mouse.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the permit area (GIS Database). Flora surveys of the permit area did not record any species of Threatened flora (Onshore Environmental, 2021). Based on the habitat present, Threatened flora species known from the Pilbara are not likely to be present within the permit area and</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.		
<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>There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the permit area (GIS Database).</p> <p>The flora and vegetation surveys over the permit area have not identified any TECs (Onshore Environmental, 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 application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99.57% of the pre-European vegetation still exists in the Pilbara Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 82 and 93 (GIS Database). These vegetation associations have not been extensively cleared as over 99.9% of the pre-European extent of these vegetation associations remain uncleared at both the state and bioregional level (Government of Western Australia, 2019). The permit area does not contain any remnants nor does it form part of any remnants in the local area (GIS Database).</p>	Not 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>There are no conservation areas in the vicinity of the application area. The nearest DBCA managed land is the former Meentheena Pastoral Lease which is located approximately 84 kilometres east of the application area (GIS Database). Given the distance to the nearest conservation area, the proposed clearing is unlikely to impact on the environmental values of any conservation area.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<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>There are several minor ephemeral drainage lines which intersect the application area (GIS Database). These drainage lines are common in the local area (20 kilometre radius) and the proposed clearing is not likely to have a significant impact on riparian vegetation and surface water flow on a broader scale.</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 application area lies within the Boolgeeda, Capricorn, Platform and Satirist land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development). All of these land systems are generally not susceptible to erosion (Van Vreeswyk et al., 2004)</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (i):</u> “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.”</p> <p><u>Assessment:</u></p> <p>There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows or to cause deterioration in the quality of underground water.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u></p> <p>The climate of the region is semi-arid, with a low average rainfall of approximately 391.8 millimetres per year (BoM, 2022). Drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall.</p> <p>There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</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 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.
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):

- 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)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- 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

- Biologic (2020) Miralga Creek Project: Conservation Significant Fauna Impact Assessment. Prepared for Atlas Iron Ltd, by Biologic Environmental Survey, February 2020.
- BoM (2022) Bureau of Meteorology Website – Climate Data Online, Marble Bar. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 21 January 2022).
- 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 Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 27 January 2022).
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- 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>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- 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.
- Onshore Environmental (2021) Abydos Project – Terrestrial Flora and Fauna Gap Analysis and Risk Assessment. Prepared for KADA Consulting, by Onshore Environmental, 3 August 2021.
- Outback Ecology Services (2012) Abydos East Link Road, Terrestrial Fauna Impact Assessment. Prepared for Atlas Iron Limited, by Outback Ecology Services, September 2012.
- 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.
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4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , 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	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
RWI Act	<i>Rights in Water and Irrigation Act 1914</i> , 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.