

BHP

Impact Reconciliation Procedure

Newman Hub (Western Ridge)

**January 2023
Version 1**

Authorisation

Version	Position	Date
Version 1	Manager Environment WA Iron Ore	23/01/2023

Document amendment record

Version	Section/page	Version description	Key changes	Date
Version 1	All	Submitted to Office of the EPA to meet Condition 16-6 of Ministerial Statement 1105	New document	23/01/2023

Abbreviations

Term	Meaning
BHP	BHP Iron Ore Pty Ltd
CEO	Chief Executive Officer
ECW	Enhanced Compressed Wavelet
EPA	Environmental Protection Authority
ESRI	Environmental Systems Research Institution
GDA2020	Geocentric Datum of Australia 2020
GeoTIFF	Geographic Tagged Image File Format
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
the Instructions	<i>Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports (EPA 2021)</i>
IRP	Impact Reconciliation Procedure
IRR	Impact Reconciliation Report
m	metres
MRF	Mining Rehabilitation Fund
MS	Ministerial Statement
NVCP	Native Vegetation Clearing Permit

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1 The proposal and condition requirements

1.1 The Proposal

This Impact Reconciliation Procedure (IRP) has been prepared by BHP Iron Ore Pty Ltd (BHP) to satisfy Condition 16 of Ministerial Statement 1105 (MS 1105) for the Pilbara Expansion Strategic Proposal, to support the request that the Western Ridge referred proposal (Western Ridge Proposal) be declared a Derived Proposal. The IRP has been developed in accordance with the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (EPA 2021) (the Instructions).

The purpose of this IRP is to outline the methods used to calculate the area of vegetation or environmental value/s impacted within the Hamersley Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the Pilbara bioregion, in relation to the Western Ridge Proposal. This IRP does not apply to clearing undertaken under the authority of other existing approvals for existing operations at the Newman Hub (i.e. other Ministerial Statements or Native Vegetation Clearing Permits (NVCPs)) that intersect the vegetation or environmental value/s requiring offset.

1.2 Ministerial Statement condition requirements

BHP is required to prepare and submit an IRP to the Chief Executive Officer (CEO) prior to ground-disturbance as per Conditions 16-6 and 16-7 of MS1105 for the Pilbara Expansion Strategic Proposal (Table 1).

Table 1: Ministerial Statement 1105 condition requirements

Condition number	Condition requirements
16-6	Prior to ground-disturbing activities, the proponent shall prepare and submit an Impact Reconciliation Procedure to the CEO.
16-7	The Impact Reconciliation Procedure required pursuant to condition 16-6 shall: <ol style="list-style-type: none"> (1) state that clearing calculations for each biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the CEO; (2) include a methodology to calculate the amount of clearing undertaken during each year of the biennial reporting period for each of the significant residual impacts identified in condition 16-2; and (3) indicate the timing and content of the Impact Reconciliation Reports.

2 Procedure

2.1 Identification of the environmental values requiring offsets

The environmental values required to be offset have been identified through the environmental impact assessment for the Western Ridge Proposal and/or by MS1105 Condition 16 (Table 2).

The environmental impact assessment for the Western Ridge Proposal found that following mitigation, there is potential for significant residual impacts on Terrestrial Fauna from the clearing of critical habitat for the Ghost Bat and Pilbara Olive Python. In addition, during the assessment of the Pilbara Expansion Strategic Proposal, the Environmental Protection Authority (EPA) considered that the clearing of native vegetation in Good to Excellent condition is a significant residual impact due to the cumulative impacts of clearing in the Pilbara (EPA 2018) (Table 2).

Table 2: Environmental values from MS1105 relevant to the Western Ridge Proposal that require offset

Condition	Environmental value/s	IBRA Region	Offset rate documented in Statement (\$/ha)
16-2(1)	Clearing native vegetation in Good to Excellent condition, including habitat for threatened fauna species within the Development Envelope	Hamersley	Contribution rate for the 2022/2023 financial year as published for the Pilbara Environmental Offsets Fund (as per Condition 16-4 of MS1105)

As discussed in Section 1.1, this IRP does not apply to clearing undertaken under the authority of other existing approvals for existing operations at the Newman Hub. This IRP applies only to clearing within the Western Ridge Proposal Development Envelope (Figure 1) for above and below water table mining of the Eastern Syncline, Bill's Hill, Silver Knight and Mount Helen deposits, and associated stockpiles and infrastructure. This IRP does not apply to existing roads and infrastructure or clearing associated with the adjacent Mt Whaleback and Orebody 29/30/35 mining operations (clearing for which is approved under NVCP 5617), which overlap the northern portion of the Development Envelope (Figure 1).

The Western Ridge Proposal is seeking authorisation for the clearing of up to 4,281 ha of native vegetation within the Development Envelope, all of which is located the Hamersley IBRA subregion of the Pilbara bioregion.

Vegetation condition mapping of the Development Envelope was undertaken in 2019, 2020 and 2021 in accordance with the EPA Technical Guidance for Flora and Vegetation (EPA 2016a; Biologic 2020a, 2020b, 2021a, 2021b). Most (66%) of the Development Envelope was rated as being in Excellent condition, with approximately 12% and 6% in Very Good and Good condition, respectively (Figure 1). The remaining area is considered to be in Poor or lower condition (Figure 1), and this lower condition is due to existing disturbance and infrastructure for the existing Newman Hub operations or from exploration activities (as authorised under NCVPs).

Of the 4,281 ha of clearing within the Hamersley IBRA subregion of the Pilbara bioregion, up to 3,863 ha of native vegetation is in Good to Excellent condition and will require offset.

Detailed fauna habitat mapping of the Development Envelope was undertaken in 2019 and 2020 in accordance with the EPA Technical Guidance for Vertebrate Fauna relevant at the time of surveying (EPA 2016b, 2016c; Biologic 2020c, 2020d). A total of 10 fauna habitat types were identified and mapped within the Development Envelope (Figure 2). Of these habitat types, Gorge/Gully and Breakaway/Cliff were identified as critical roosting habitat for Ghost Bat (as they contain significant roost caves), and critical denning/breeding and hunting habitat for Pilbara Olive Python. Together, these habitat types occur across approximately 187 ha (representing <3%)

of the Development Envelope (Figure 2). The Drainage Area/Floodplain, Mulga Woodland, Stony Plain and Minor Drainage Line habitat types were also identified as critical foraging habitat for Ghost Bat. These habitat types represent over half (61%) of the Development Envelope occurring across approximately 4,417 ha (Figure 2).

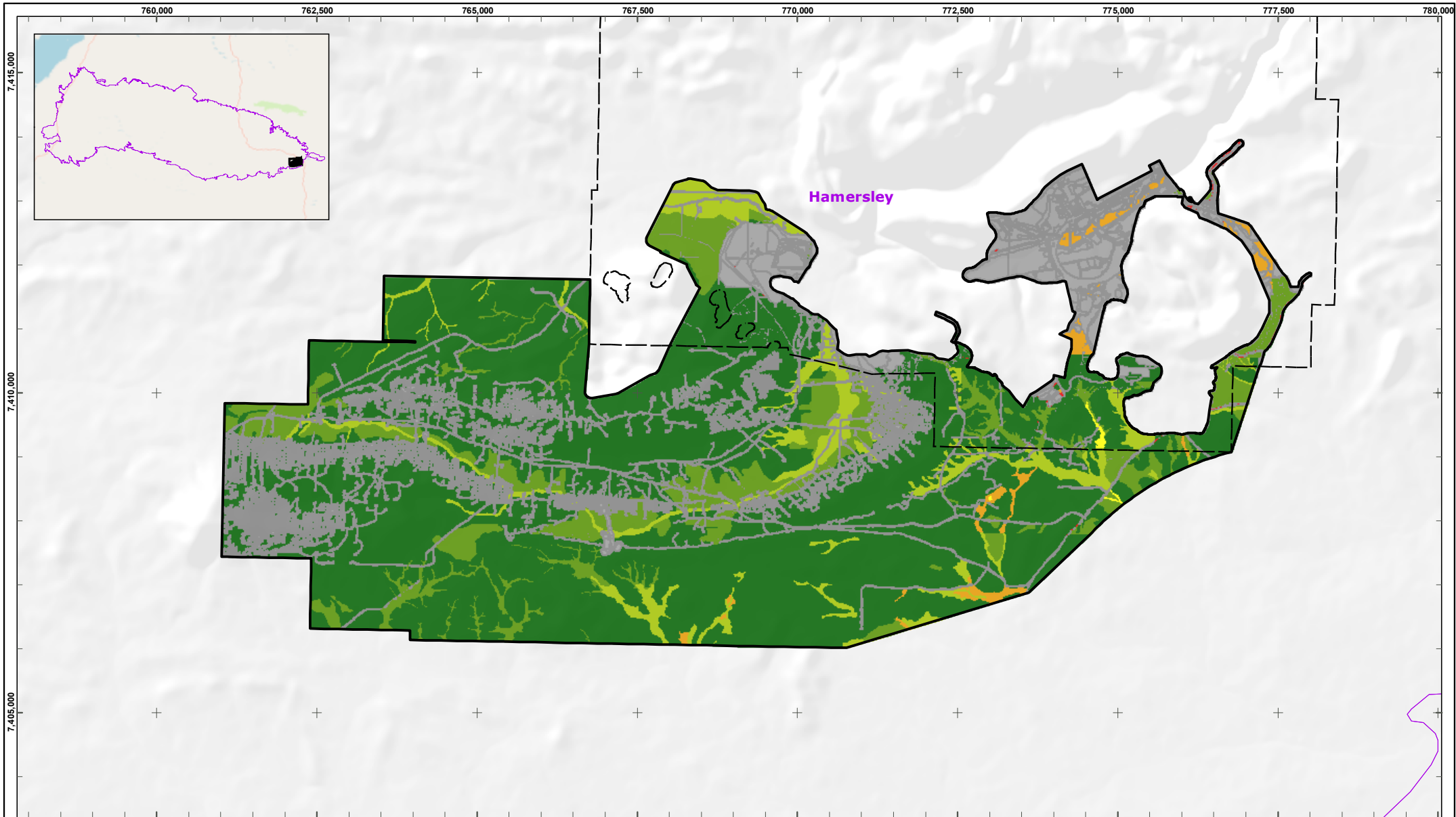
Based on the Indicative Footprint for the Western Ridge Proposal (i.e. the area where clearing is proposed), the total extent of clearing of Gorge/Gully and Breakaway/Cliff habitat is up to 147 ha and of critical foraging habitat is up to 2,534 ha, and will require offset.

In order to avoid duplication of offsets, the extent of residual impact to be offset for vegetation in Good to Excellent condition, will exclude the extents to be offset for critical fauna habitats (where the vegetation is in Good to Excellent condition), given that offsets for critical fauna habitat will be paid at the higher published rate. As a result, the amount of native vegetation in Good to Excellent condition that will require offset is 1,183 ha.

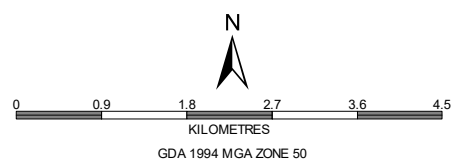
In summary, of the 4,281 ha of clearing within the Hamersley IBRA subregion of the Pilbara bioregion, up to 3,863 ha of native vegetation will require offset, comprising:

- 1,183 ha of native vegetation in Good to Excellent condition
- 147 ha of critical habitat for Pilbara Olive Python (Gorge/Gully and Breakaway/Cliff)
- 2,534 ha of critical foraging fauna habitat for Ghost Bat (Drainage Area/Floodplain, Mulga Woodland, Stony Plain and Minor Drainage Line)¹.

¹ The 2,534 ha extent of critical foraging habitat for Ghost Bat that coincides with vegetation in Poor to Excellent condition. The extent of the critical foraging habitat with vegetation in Degraded or Completely Degraded condition is excluded on the basis that these areas are highly unlikely to support the species as they lack the key features required to support foraging (i.e. treed vegetation that provides foraging perches) and/or are significantly less productive when compared to the surrounding critical foraging habitat within the Development Envelope in Poor or better condition.



- Hamersley subregion
 - Proposed Development Envelope
 - NVCP 5617/5
- Vegetation Condition**
- Excellent
 - Very Good
 - Good
 - Poor
 - Degraded
 - Completely Degraded
 - Indicative Cleared Area

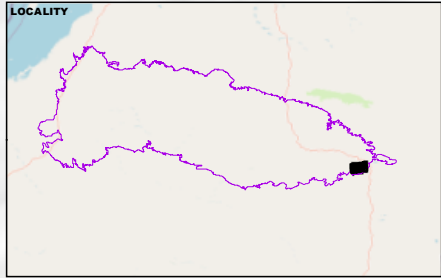
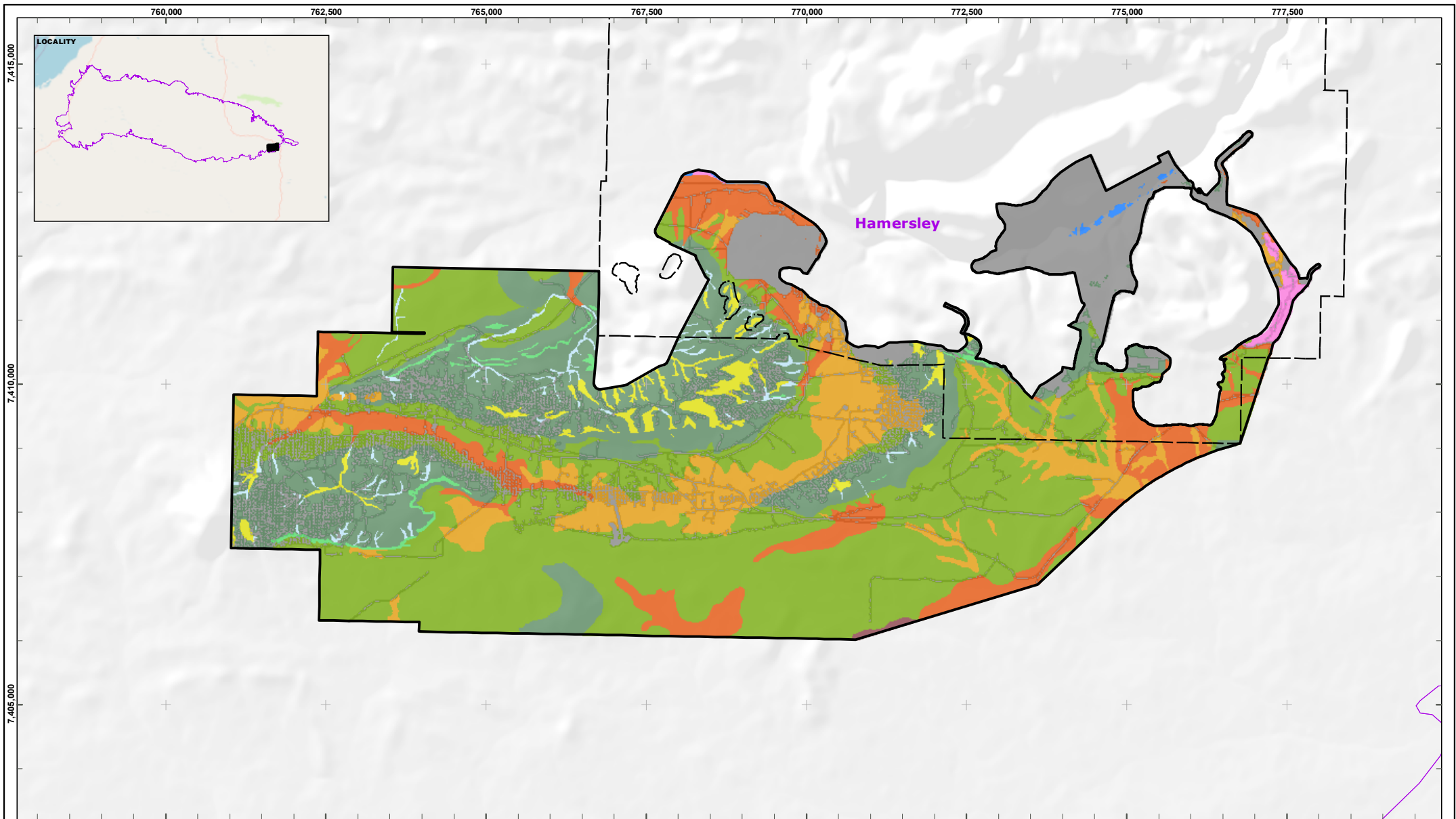


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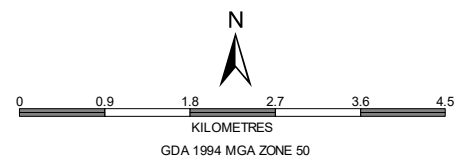
**IMPACT RECONCILIATION PROCEDURE
WESTERN RIDGE - VEGETATION CONDITION**

PLANNING & STANDARDS - IRON ORE

SCALE @ A3:	1:80,000	PREPARED:	P. Gant	FIGURE:	1
DATE:	16/01/2023	REQUESTOR:	B. Menezies	NO:	Job No. A881



- | | | |
|-------------------------------|---------------------------|-------------------------|
| Hamersley subregion | Habitat Type | Major Drainage Line |
| Proposed Development Envelope | Drainage Area/ Floodplain | Minor Drainage Line |
| NVCP 5617/5 | Breakaway/ Cliff | Indicative Cleared Area |
| | Gorge/ Gully | |
| | Hardpan Plain | |
| | Hillcrest/ Hillslope | |
| | Mulga Woodland | |
| | Sand Plain | |
| | Stony Plain | |



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**IMPACT RECONCILIATION PROCEDURE
WESTERN RIDGE - HABITATS**

PLANNING & STANDARDS - IRON ORE

SCALE @ A3: 1:80,000 PREPARED: P. Gant FIGURE: 2
 DATE: 16/01/2023 REQUESTOR: B. Menezies NO: Job No. A881

2.2 Method to determine impacts

As discussed in Section 2.1, Biologic Environmental Survey (Biologic) completed flora and vegetation surveying (including vegetation condition assessment and mapping) and vertebrate fauna surveying (including identification and mapping of fauna habitats for threatened fauna species) of the Western Ridge Development Envelope in accordance with EPA Technical Guidance (EPA 2016a, 2016b, 2016c). The vegetation condition and fauna habitat mapping completed during these surveys is considered to form the baseline state of the environmental values for this IRP for the Western Ridge Proposal (described further in Appendix 1).

If vegetation (or habitat) within the Development Envelope is impacted (via a different approval) in the period between the completion of the baseline survey and the Notice given by the Minister under Section 45B(2) that the Strategic Proposal Statement takes effect (i.e. the 'approval') for the Western Ridge Proposal, the altered state of the vegetation in BHP's internal database system will be updated to capture this new altered state for the environmental values (e.g. cleared or Completely Degraded).

2.2.1 Impacts

BHP will use the methodology detailed in Steps 1-3 of Appendix 2 to calculate the amount of land disturbance (i.e. clearing of native vegetation) within the Development Envelope from the Western Ridge Proposal.

The resulting Land Disturbance dataset will then be overlaid with the baseline datasets for the environmental values, to calculate the amount of clearing of vegetation in Good to Excellent condition and of each fauna habitat type within the Hamersley IBRA subregion of the Pilbara bioregion (as per Step 4 of Appendix 2). This will result in the amount of clearing (ha) that is required to be offset for each environmental value.

The verified Land Disturbance dataset is also used to update the baseline datasets for the condition of vegetation and state of environmental value/s that is to be used for the next financial year reconciliation.

This process will be repeated annually to determine the amount of clearing in each financial year, as is required to be reported in the Impact Reconciliation Report (IRR) (see Section 3.2).

3 Reporting

3.1 Frequency and timing

The first biennial reporting period shall commence at the beginning of the financial year that ground-disturbing activities are undertaken, as per Condition 16-5 of MS1105. For the Western Ridge Proposal, clearing is estimated to commence in Q1 2024. Table 3 documents the first five biennial reporting periods for the Western Ridge Proposal.

As per the Instructions, the IRR will be submitted no later than four months after the conclusion of the biennial reporting period. As specified in Table 3, BHP propose to submit the IRR on the last business day in September following the end of the reporting period.

Table 3: Reporting period and frequency of the Impact Reconciliation Reports

Biennial period	Action	Timing
	Ministerial Statement 1105 issued	11 July 2019
	Notice given that the Strategic Proposal Statement takes effect for the Western Ridge Proposal	TBC
	Western Ridge clearing commences	Estimated to commence Q1 2024
Period 1	First biennial reporting period	1 July 2023 to 30 June 2025
	IRR submitted to DWER	30 September 2025
Period 2	Second biennial reporting period	1 July 2025 to 30 June 2027
	IRR submitted to DWER	30 September 2027
Period 3	Second biennial reporting period	1 July 2027 to 30 June 2029
	IRR submitted to DWER	28 September 2029
Period 4	Second biennial reporting period	1 July 2029 to 30 June 2031
	IRR submitted to DWER	30 September 2031
Period 5	Second biennial reporting period	1 July 2031 to 30 June 2033
	IRR submitted to DWER	30 September 2033

3.2 Impacts and reconciliation

Ground-disturbing activities for the Western Ridge Proposal will wholly occur within the Development Envelope and are expected to commence in Q1 2024. As per Condition 16-8 of MS1105, ground-disturbing activities will not commence, unless otherwise agreed by the CEO, until the CEO has confirmed in writing that the IRP satisfies the requirements of Condition 16-7 (Table 1).

As discussed in Section 2.1, clearing of vegetation in Good to Excellent condition and of habitats for threatened fauna within the Hamersley IBRA subregion of the Pilbara bioregion will be up to 4,041 ha. The majority of clearing is expected to occur within the first biennial reporting period, associated with the construction phase

and development of mining at the four deposits. The Western Ridge Proposal is estimated to have a maximum project life of 31 years (comprising construction, operations, and closure), with no clearing expected to occur beyond 2055. As detailed in Section 2.2, the clearing of vegetation will be captured spatially and reconciled against the baseline data (for vegetation condition and fauna habitats) within the Development Envelope.

As per Condition 16-10 of MS1105, the IRR will provide the location and spatial extent of the clearing undertaken within each biennial reporting period. More specifically, the following information will be submitted in each IRR:

- amount of clearing (ha) of fauna habitats identified as critical for Ghost Bat and Pilbara Olive Python, and vegetation in Good to Excellent condition, within the Hamersley IBRA subregion of the Pilbara bioregion that has occurred during each financial year of the reporting period, including the offset rate
- information used to validate amount of clearing (e.g. aerial imagery, remote sensing data, digitised polygons and/or ground-truthing surveys) in each financial year
- information regarding any exemptions, other clearing approvals or reductions to contributions to the fund (e.g. where impacts have occurred that are applied to a different Ministerial Statement or NVCP)
- forward estimate of impacts expected to be reported in subsequent reporting periods.

4 References

BHP Iron Ore Pty Ltd (BHP) (2020) Biodiversity Survey Spatial Data Requirements Procedure. Document number SPR-IEN-EMS-015. Version 11.0. Published January 2020.

Biologic Environmental Survey (Biologic) (2021a) *Western Ridge Single Season Detailed Flora and Vegetation Survey*. Report prepared for BHP.

Biologic Environmental Survey (Biologic) (2021b) *Western Ridge Pipeline Reconnaissance Flora and Vegetation Survey*. Report prepared for BHP.

Biologic Environmental Survey (Biologic) (2020a) *Coombanbunna Well Detailed Flora and Vegetation Survey*. Report prepared for BHP.

Biologic Environmental Survey (Biologic) (2020b) *Western Ridge Detailed Flora and Vegetation Survey*. Report prepared for BHP.

Biologic Environmental Survey (Biologic) (2020c) *Western Ridge Targeted Vertebrate Fauna Survey*. Report prepared for BHP. July 2020, Western Australia.

Biologic Environmental Survey (Biologic) (2020d) *Coombanbunna Well Level 2 Vertebrate Fauna Survey*. Report prepared for BHP. October 2020, Western Australia.

Environmental Protection Authority (EPA) (2016a) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Environmental Protection Authority. Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA) (2016b) *Technical Guidance - Sampling Methods for Terrestrial Vertebrate Fauna*. Environmental Protection Authority. Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA) (2016c) *Technical Guidance - Terrestrial Fauna Surveys*. Environmental Protection Authority. Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA) (2018) *Pilbara Expansion Strategic Proposal*. Report and recommendations of the Environmental Protection Authority. Report 1619. Perth, Western Australia. Published 9 July 2018.

Environmental Protection Authority (EPA) (2021) *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports*. Environmental Protection Authority. Western Australia. Published March 2021.

Appendices

Appendix 1 Baseline spatial data associated with the environmental value requiring offset

Biologic completed flora, vegetation and vertebrate fauna surveying of the Western Ridge Proposal Development Envelope in 2019 and 2020 (Biologic 2020a, 2020b, 2020c, 2020d, 2021). The surveying was undertaken in accordance with the EPA Technical Guidance relevant at the time of surveying (EPA 2016a, 2016b, 2016c). The flora and vegetation surveying included the assessment and mapping of vegetation condition. The condition of vegetation was mapped using the Vegetation Condition Scale for the Eremaean and Northern Botanical Provinces as per Table 2 in the EPA Technical Guidance (EPA 2016a). The vertebrate fauna survey included the identification and mapping of fauna habitats, and an assessment of their importance to threatened fauna species that are known to occur in the Development Envelope.

All baseline environmental survey data captured by Biologic during the surveys was supplied to BHP in accordance with BHP Data Standards (document SPR-IEN-EMS-015, BHP 2020). The BHP Data Standards ensure a consistent and repeatable method of capturing environmental survey data. The survey data is stored on BHP's internal database system following review for technical and spatial accuracy.

This baseline environmental survey data and existing land disturbance data is considered to form the pre-clearing extent and baseline state (of vegetation condition and fauna habitats) for this IRP for the Western Ridge Proposal.

The following spatial data is provided to support this IRP, as per the Instructions:

- **boundary:** the Western Ridge Proposal Development Envelope
- **baseline:** vegetation condition mapping (Biologic baseline survey data), fauna habitat mapping (Biologic baseline survey data), clearing/ land disturbance up to the date the Notice is given for the Western Ridge Proposal (the 'approval'), and IBRA subregions
- **imagery:** aerial imagery for the extent of the Western Ridge Proposal Development Envelope.

All spatial data is provided in a format that complies with the requirements of the Instructions, and as per the following parameters:

- **data type:** closed polygons for boundary and baseline data attributes as per Table 6 of the Instructions
- **format:** shapefile or Environmental Systems Research Institution (ESRI) geodatabase format
- **coordinate system:** Geocentric Datum of Australia 2020 (GDA2020) datum, projected into the appropriate Map Grid of Australia zone
- **imagery:** Enhanced Compressed Wavelet (ECW) format or Geographic Tagged Image File Format (GeoTIFF), at a minimum 1 m resolution.

Appendix 2 Methodology used to capture land disturbance and environmental value/s datasets

The methodology BHP will use to calculate the amount of land disturbance (i.e. clearing of native vegetation) is detailed below (Steps 1-3). This will result in a verified Land Disturbance dataset that is used to determine the amount of clearing that is required to be offset against the environmental value/s (Step 4).

Step 1 - Remotely Sensed data

BHP sources appropriate remotely sensed data (i.e. aerial photography or satellite imagery) for the area of the Impact Reconciliation Report (IRR). The remotely sensed data may come from a variety of sources and where appropriate, it will be mosaicked together. The mosaicked remotely sensed data is then re-sampled to 1 m resolution. This remotely sensed data set is used for the capture of the land clearing that is to be supplied as an end deliverable dataset.

Step 2 - Land Disturbance data

Direct land disturbance (i.e. clearing) is captured on a periodic basis throughout the financial year. The data is captured via digitising the land disturbance visible in the Remotely Sensed data, at a scale of 1:1,000. This scale is consistent with the precision of all BHP internal datasets. The data is ground-truthed by site surveyors in mining areas and geoscience technicians in resource definition drilling areas (where required).

All land disturbance data is then attributed with the reporting year, responsible operational entity, the underlying approval and the proposed or actual land-use (using the Department of Mines, Industry Regulation and Safety Mining Rehabilitation Fund (MRF) classifications). Where there are multiple approvals within the same area, the site responsible person is accountable for allocating the land disturbance to the appropriate approval.

Step 3 - Data review

Following the capture of the Land Disturbance data, the dataset is reviewed at the end of each financial year to ensure:

- all land disturbance activities for the financial year period have been identified
- accurate and clean boundaries (removal of overlaps and correction of anomalies)
- data attribute completeness and correctness.

As BHP captures land disturbance/clearing at a scale of 1:1,000 (i.e. +/- 0.5 m on the ground), any polygon slivers or gaps in the dataset under one square metre are ignored and are considered acceptable in the context of analysing datasets at vastly different scales.

Step 4 - Processing of environmental value/s datasets

BHP have developed a methodology which automates the process of combining Land Disturbance, IBRA subregions and environmental value/s (e.g. vegetation condition) datasets to ensure the process of deriving the final offset calculation is consistent and repeatable. The process manipulates the datasets (e.g. clips inputs to the project Development Envelope, cleans any overlaps) to match the requirements of the Instructions, resulting in a final area calculation.