

REPORT



# Ecological Cumulative Impact Assessment – Vulcan South

for Vitrinite Pty Ltd

12/08/2024

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# 1 Introduction

Vulcan South (the Project) is a new small-scale coal-mining operation proposed by Vitrinite Pty Ltd; owner of Qld Coal Aust No.1 Pty Ltd and Callan Coking Coal Pty Ltd (Vitrinite). A site-specific Environmental Authority (EA) and Progressive Rehabilitation and Closure Plan (PRCP) application (A-EA-NEW-100265025) was lodged on 6 June 2022 with the Department of Environment and Science (DES). DES has requested additional information be provided to assess the proposed Project's cumulative impacts; including other major projects or developments of which Vitrinite is reasonably aware.

This ecological cumulative impact assessment quantifies impacts to terrestrial ecological values, as outlined in the Vulcan South Terrestrial Ecological Assessment, to comparable projects in the broader region to outline the expected quantum of total impacts to these values in a regional context. Please refer to **Figure 2-1** below.

# 2 Scope

This assessment will consider the impacts of projects within:

- The Brigalow Belt North bioregion as defined by the Queensland Government IBRA dataset, with particular attention to the:
  - Northern Bowen Basin sub-bioregion; and
  - The Isaac - Comet Downs sub-bioregion.

In addition, this assessment will consider impacts of projects approved and/or commenced within the following time frames:

- No earlier than 01/01/2013; and
- No later than 01/01/2033.

The scale of projects will also be considered, limited to those considered "Major" by their inclusion in the project lists outlined in Section 4 and therefore comparable to Vulcan South.

Matters identified as key matters in this Project, on a State and/or Commonwealth level, have been included based on the results of field assessments confirming their presence within the Study Area, as outlined in the Terrestrial Ecology Assessment.

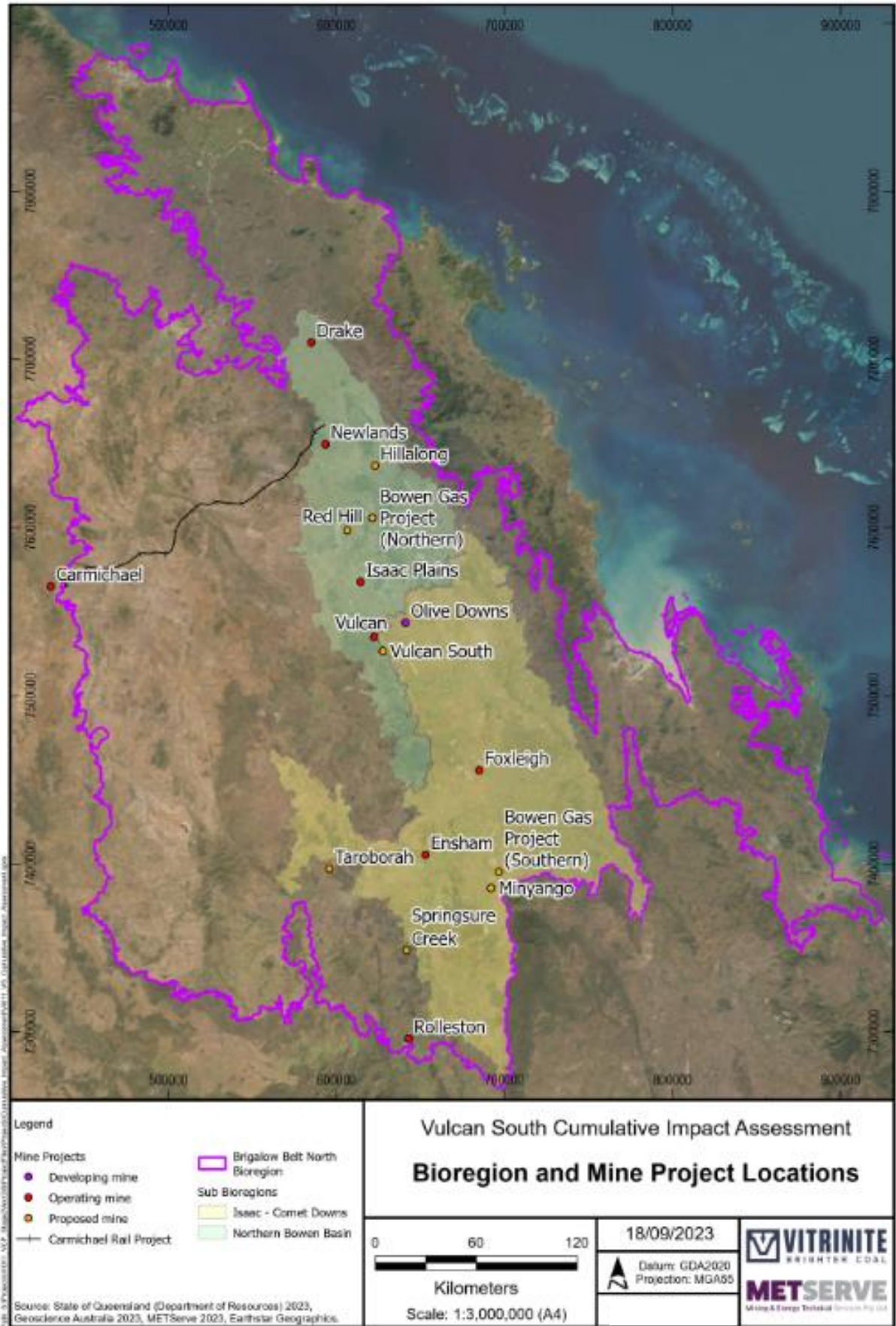


Figure 2-1 Projects included in the Cumulative Impact Assessment

## 2.1 Limitations

It should be noted that matters discussed in this assessment may not have been listed as Threatened under the *Nature Conservation Act 1992* (NC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) at the time of publication of the various EIS documents, and therefore not considered in older impact statements. Habitat values could not be quantified for these species.

It was also observed that projects listed as “currently going through the EIS process” may not have any publicly available data at the time of writing, and therefore impacts could not be quantified.

This assessment does not take into consideration the quality or carrying capacity of habitat for species as this data is generally not available in the source material.

Matters not confirmed as present have not been included. This includes species that are likely or known to occupy the airspace above the Project and are therefore unlikely to directly interact with the impact area, for example, White-throated Needletail (*Hirundapus caudacutus*).

As the Brigalow Threatened Ecological Community (TEC) is not mapped in detail by the Commonwealth, relevant State mapped Regional Ecosystems (REs) considered as equivalent to this TEC, which are mapped in the Vulcan South footprint, have been used to quantify impacts where available. In some cases, the data used in this assessment was presented in the source material as REs, so in these cases the individual REs were presented. In other cases, the TEC was presented as a final estimate without a breakdown of component REs. It should therefore be acknowledged that in these instances, component REs may differ.

It should also be noted that habitat quality and utility to matters have not been separated in this assessment as these are generally not separated in supporting documents, so are calculated as a whole for each matter.

### 2.1.1 Matters addressed in this assessment

The relevant matters for Vulcan South, as identified in the Vulcan South Terrestrial Ecological Assessment, are outlined in **Table 2-1**.

**Table 2-1 Matters relevant to Vulcan South**

Matter	Scientific name	Listing under State legislation	Listing under Commonwealth legislation (EPBC Act)
Koala	<i>Phascolarctos cinerus</i>	Endangered (NC Act)	Endangered
Greater glider	<i>Petauroides volans</i>	Endangered (NC Act)	Endangered
Squatter pigeon (Southern)	<i>Geophaps scripta scripta</i>	Vulnerable (NC Act)	Vulnerable
Brigalow TEC	N/A	As relevant Endangered or Of Concern Regional Ecosystems (Vegetation Management Act 1999)	Endangered

### 3 Methodology

Government databases were searched to locate lists of projects and ascertain which of these meet the criteria outlined in **Section 2**. These are outlined in **Table 3-1** below.

**Table 3-1 Sources of Project listings**

Source	Date Accessed	Notes
Completed EIS processes	06/09/2023 1130 GMT + 10	Available at: <a href="https://www.qld.gov.au/environment/management/environmental/eis-process/projects/completed">https://www.qld.gov.au/environment/management/environmental/eis-process/projects/completed</a>
Coordinated projects	07/09/2023 0900 GMT + 10	Available at: <a href="https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects">https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects</a>

Each project deemed relevant to the purposes of this assessment were searched for impact data within the following documents in order of preference:

- EIS Assessment Reports;
- Significant Impact Assessments (SIA); and
- Environmental Authorities (EA).

The relevant information relating to each Matter outlined in **Section 2.1** was compiled in **Section 4**. The areas of impact were added together to quantify the total, or cumulative impact of the assessed projects.

## 4 Assessment of Cumulative Impacts

Cumulative impacts to Endangered and Of Concern REs and TECs, for each identified project, are outlined in **Table 4-1**.

**Table 4-1 Cumulative impacts to Endangered and of Concern Regional Ecosystems (ha)**

Project	Area of Endangered REs under the VM Act and Biodiversity Status equivalent to the Brigalow TEC (ha)			Area of TEC if quantified in source document (ha)	Total area (ha)	Notes
	11.3.1 <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	11.4.8 <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	11.4.9 <i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains			
Adani Mine Project	-	-	-	195.0	195.0	
Bowen Gas Project	44.1	35.6	179.9	-	259.6	
Carmichael Rail Project	-	-	-	117.1	117.1	Quantum provided in revised MNES report
Drake Coal	-	-	-	8.9	8.9	
Ensham Life Of Mine Extension Project	-	-	-	-	0	
Foxleigh Plains Project	-	-	-	83.7	83.7	
Galilee Coal	-	-	-	81.0	81.0	
Hillalong Project	-	-	-	-	0	
Isaac Downs / Plains Project	-	-	-	8.2	8.2	
Minyango Project	-	-	-	-	0	
Newlands Coal Expansion Project	15.0	-	-	-	15.0	
Olive Downs Coking Coal Project	-	-	-	13.0	13.0	
Red Hill Mining Lease	-	-	-	188.0	188.0	
Rolleston Coal Expansion Project		2.0	48.0	-	50.0	
Springsure Creek Coalmine Project	161.8	-	11.2	-	173.0	Heterogenous polygons in the assessment report are assumed to be evenly divided among REs.
Taraborah	-	-	-	2.8	2.8	



Project	Area of Endangered REs under the VM Act and Biodiversity Status equivalent to the Brigalow TEC (ha)			Area of TEC if quantified in source document (ha)	Total area (ha)	Notes
	11.3.1 <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	11.4.8 <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	11.4.9 <i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains			
Vulcan Coal Mine	-	-	-	-	0	
Vulcan South	0	66.9 (remnant) 4.0 (High value regrowth)	0.2 ha	-	71.1	

Cumulative impacts to Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES), for identified projects, are outlined in **Table 4-2**. As Greater Glider habitat was not quantified for a number of assessed projects, Koala habitat calculations have been used a proxy due to the similarity in habitat features and composition.

**Table 4-2 Cumulative impacts to MNES and MSES Threatened species**

Project	Koala habitat (ha)	Greater Glider habitat (ha)	Squatter Pigeon (Southern) habitat (ha)	Project Bioregion	Notes
Adani Mine	30.0	Not mapped/quantified 30.0*	30.0	Brigalow Belt North	
Bowen Gas Project	2466.0	Not mapped/quantified 2466.0*	1415.2	Northern Bowen Basin	
Carmichael Rail Project	1433.3	Not mapped/quantified 1433.3*	145.7	Brigalow Belt North	Quantum from revised MNES report
Drake Coal	176.5	Not mapped/quantified 176.5*	176.5	Brigalow Belt North	
Ensham Life of Mine Extension Project	Negligible	Negligible	Negligible	Isaac – Comet Downs	
Foxleigh Plains Project	Not mapped/quantified	Not mapped/quantified	201.0	Isaac – Comet Downs	Combined total habitat (remnant and non-remnant)

Project	Koala habitat (ha)	Greater Glider habitat (ha)	Squatter Pigeon (Southern) habitat (ha)	Project Bioregion	Notes
Hillalong Project	603.2	Not mapped/quantified 603.2*	485.6	Brigalow Belt North	
Isaac Downs Project	131.9	120.9	122.1	Northern Bowen Basin	
Minyango Project	Not mapped/quantified	Not mapped/quantified	Mentioned but no quantum given	Isaac – Comet Downs	
Newlands Coal Extension Project	No suitable habitat	Not mapped/quantified	546	Northern Bowen Basin	
Olive Downs Coking Coal Project	5,583.5	5,583.5	5,610.0	Isaac – Comet Downs	
Red Hill Mining Lease	946.0	Not mapped/quantified 946.0*	Not mapped/quantified	Northern Bowen Basin	
Rolleston Coal Expansion Project	158.0	Not mapped/quantified 158.0*	2,891.0	Brigalow Belt North	
Springsure Creek Coalmine Project	Mentioned but no habitat quantum given	Not mapped/quantified	Not mapped/quantified	Brigalow Belt North	Koala considered SLC in the EIS Assessment Report, dated 2013
Taraborah	Not mapped/quantified	Not mapped/quantified	Mentioned but not considered likely to occur	Brigalow Belt North	
Vulcan Coal Mine	93.1 ha of foraging/shelter/dispersal	93.1 ha of breeding/shelter/foraging/dispersal habitat	93.1 ha of foraging habitat (76.4 ha of which are also breeding habitat)	Northern Bowen Basin	
Vulcan South	938.6 ha of foraging/shelter/dispersal 45.5 ha of shelter/dispersal 182.8 ha of dispersal	1056.8 (total) ha of breeding/shelter/foraging/dispersal	858.8 ha of breeding and foraging  338.6 ha of foraging only  1318.1 ha of dispersal	Northern Bowen Basin/Isaac – Comet Downs	

\* denotes where Koala habitat calculations have been used as a proxy in place of lacking data.

## 5 Impact in the context of the 2020 – 2021 SLATS Report and the REDD Database

The Statewide Landcover and Trees Study (SLATS) monitors woody vegetation extent in Queensland using Sentinel-2 satellite imagery as a primary monitoring tool from 2018 to 2021.

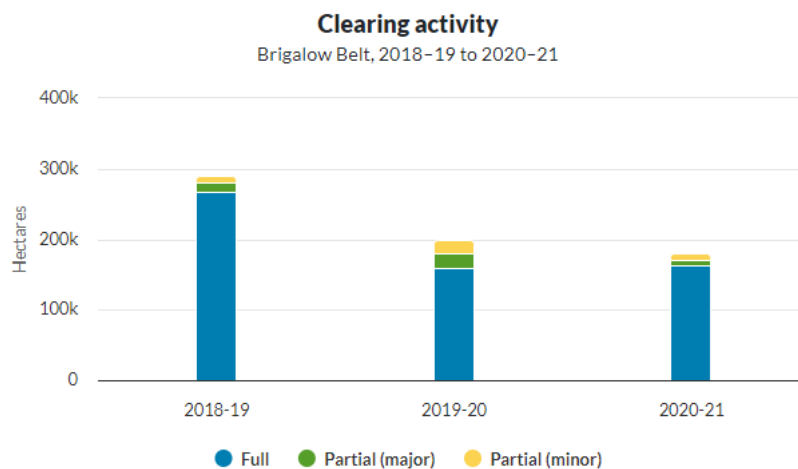
Data summaries are presented in the most recent SLATS report by bioregion. Sub-bioregions are not considered in these reports, therefore comparisons in clearing extent for this Project will be made against the Brigalow Belt bioregion as a whole.

Of the state’s 13 bioregions, the Brigalow Belt (52% or 180,283ha) accounted for over half of the state’s woody vegetation clearing activity, where over 90% of the clearing activity was mapped as full clearing.

Clearing activity is defined below, taken directly from the 2020-2021 SLATS report:

- *Full clearing refers to areas which have been converted from woody to non-woody (i.e. less than 10% crown cover remains).*
- *Partial (major) are clearing areas where the woody vegetation has been significantly modified but remains woody (i.e. greater than 10% crown cover remains but more than 50% of the area has been affected by the clearing).*
- *Partial (minor) are clearing areas where some modification of the woody vegetation has occurred, remaining woody (i.e. greater than 10% crown cover remains but less than 50% of the area has been affected by the clearing).*

From 2018–19 to 2020–21, the total quantum of clearing within the Brigalow Belt has decreased overall, refer to the graph in **Figure 5-1**.



**Figure 5-1** Clearing activity taken directly from the 2021 SLATS report

The data illustrated in **Figure 5-1** (above) is presented in **Table 5-1** below, compared to the total clearing undertaken during each reporting period.

**Table 5-1 Total clearing of all REs within the Brigalow Belt bioregion by SLATS reporting period**

Year	Full clearing	Partial clearing (major)	Partial clearing (minor)	Total	Total Vulcan South clearing footprint (1,476.44) as % of total compared to each SLATS period
2018-2019	266,597	13,926	10,430	290,953	0.5
2019-2020	158,456	21,440	19,322	199,218	0.74
2020-2021	163,535	7,276	9,472	180,283	0.81

The information above in **Table 5-1** is useful for comparing clearing in the context of a particular year, however the proposed Vulcan South clearing footprint compared to pre-clearing total vegetation cover and 2021 remnant vegetation, is more useful for quantifying impacts in a regional context.

The Regional Ecosystem Description Database (REDD) was queried for information on estimated pre-clear and 2021 remnant extents. These are expressed as the total for the entire RE extent statewide and clipped to the subregion extents using shapefiles downloaded from the QSpatial Catalogue and processed with ArcGIS with respect to percentages of cover contained in heterogeneous polygons.

Remnant vegetation in each sub-bioregion compared to pre-clearing estimates and current remnant estimates are presented in **Table 5-2** below.

**Table 5-2 Estimated remnant vegetation for all REs- pre-clearing and as of 2021**

Subregion	Pre-clearing (ha)	Remnant 2021 (ha) (percent remnant)
Northern Bowen Basin	1,316,957	774,921 (58.79%)
Isaac – Comet Downs	2,693,397	570,968 (21.29%)

These datasets were further clipped and compared to the clearing footprint for Vulcan South in **Table 5-3** below.

**Table 5-3 Estimated extents of clearing of Brigalow TEC equivalent Regional Ecosystems**

Regional Ecosystem	Estimated pre-clear extent (total ha)	Estimated pre-clear extent within sub-bioregion						Estimated remnant extent 2021 (total ha)	Estimated remnant extent 2021 within sub-bioregion					
		Brigalow Belt North		Northern Bowen Basin		Isaac – Comet Downs			Brigalow Belt North		Northern Bowen Basin		Isaac – Comet Downs	
		Total (ha)	% impacted by Vulcan South	Total (ha)	% impacted by Vulcan South	Total (ha)	% impacted by Vulcan South		Total (ha)	% impacted by Vulcan South	Total (ha)	% impacted by Vulcan South	Total (ha)	% impacted by Vulcan South
<b>11.3.1</b>	785,000	428,507	0	19,034	0	276,559	0	80,000	58,528	0	5,980	0	21,350	0
<b>11.4.8</b>	728,000	578,722	0.011	22,987	0.291	315,009	0.021	67,000	63,304	0.105	3,120	2.144	19,294	0.346
<b>11.4.9</b>	989,000	870,844	<0.000	60,150	0.033	412,924	0.004	89,000	82,328	0.024	6,170	0.324	23,138	0.086
<b>Total</b>	2,502,000	1,878,073	0.011	1,021,171	0.324	1,004,492	0.025	236,000	204,160	0.129	15,270	2.468	63,782	9

## 6 Discussion

The Project will contribute to impacts to the matters listed within this document, however it should be noted that data for these matters is absent prior to their listings as threatened. It follows that project impact assessments that occurred prior to listings will not have provided useful comparative data. Therefore, an incomplete picture of impacts will be provided in the absence of a more thorough investigation of total habitat values for each of these matters, with consideration to unmapped habitat aspects such as connectivity, availability of hollows and other complex attributes being required.

For example, the Greater Glider was not listed as threatened under the category of vulnerable under the EPBC Act until 2016, then in Queensland under the NC Act in 2019. Furthermore, it was treated as a single species until 2022. In 2022, the split into three species was formally recognised, all of which occur in Queensland and were updated to endangered under the EPBC Act and the NC Act. Studies conducted prior to 2016, therefore will not consider Greater Glider habitat.

In addition, the Koala was not listed as vulnerable under the EPBC Act until 2016 or under the NC Act until 2019, being upgraded to endangered in 2022.

The Squatter Pigeon (southern) was classed as vulnerable under the EPBC Act in 2015 and under the NC Act in 2019.

Therefore, the comparisons could only be made where data was available.

With the impact areas being disconnected and often separated by considerable distances, the likelihood of the Project contributing to impacts greater than the sum of itself and neighbouring projects, and to a lesser extent the more distant projects is negligible. The impacts therefore are likely to be additive rather than cumulative.

## 7 Conclusion

The Project will contribute to an impact on the following matters, where data is available:

- Brigalow TEC equivalent REs contained within Vulcan South clearing footprint by:
  - 11.3.1
    - 0% of the remnant extent in Isaac – Comet Downs
    - 0% of the remnant extent in the Northern Bowen Basin
    - 0% of the remnant extent in the total Brigalow Belt North;
  - 11.4.8
    - 0.346% of the remnant extent in Isaac – Comet Downs
    - 2.144% of the remnant extent in the Northern Bowen Basin
    - 0.105% of the remnant extent in the total Brigalow Belt North; and
  - 11.4.9
    - 0.086% of the remnant extent in Isaac – Comet Downs
    - 0.324% of the remnant extent in the Northern Bowen Basin
    - 0.024% of the remnant extent in the total Brigalow Belt North.

For the quantifiable habitat clearing for major projects within the Brigalow Belt North sub bioregion (including Isaac-Comet Downs and the Northern Bowen Basin) since January 2013, Vulcan South will include a conservative maximum of:

- 7.4% of the total Koala habitat cleared by similar projects (assessed in **Table 4-2**);

- 6.8% of the total Squatter Pigeon (southern) habitat cleared by similar projects; and
- 8.3% of the total Greater Glider habitat cleared by similar projects.
- These impacts in respect to Vulcan South and nearby projects are likely to be additive as the quantum of impacts is unlikely to be greater than the sum of the individual impacts as these are generally widely separated.

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