Central Tallering Land system) the area still supports taxa of conservation significance and distinctive floristic communities.

Vegetation communities mapped within the survey area occurring on the BIF range include ArrTdHc on upper slope and crests, AtEgCd on mid to lower slopes and hills, and AEgRc on lower slopes and colluvial flats. These three vegetation types are considered representative of the Yalgoo vegetation complexes PEC. There is 1,041.09 ha of the Yalgoo vegetation complexes PEC within the survey area.

Flora diversity

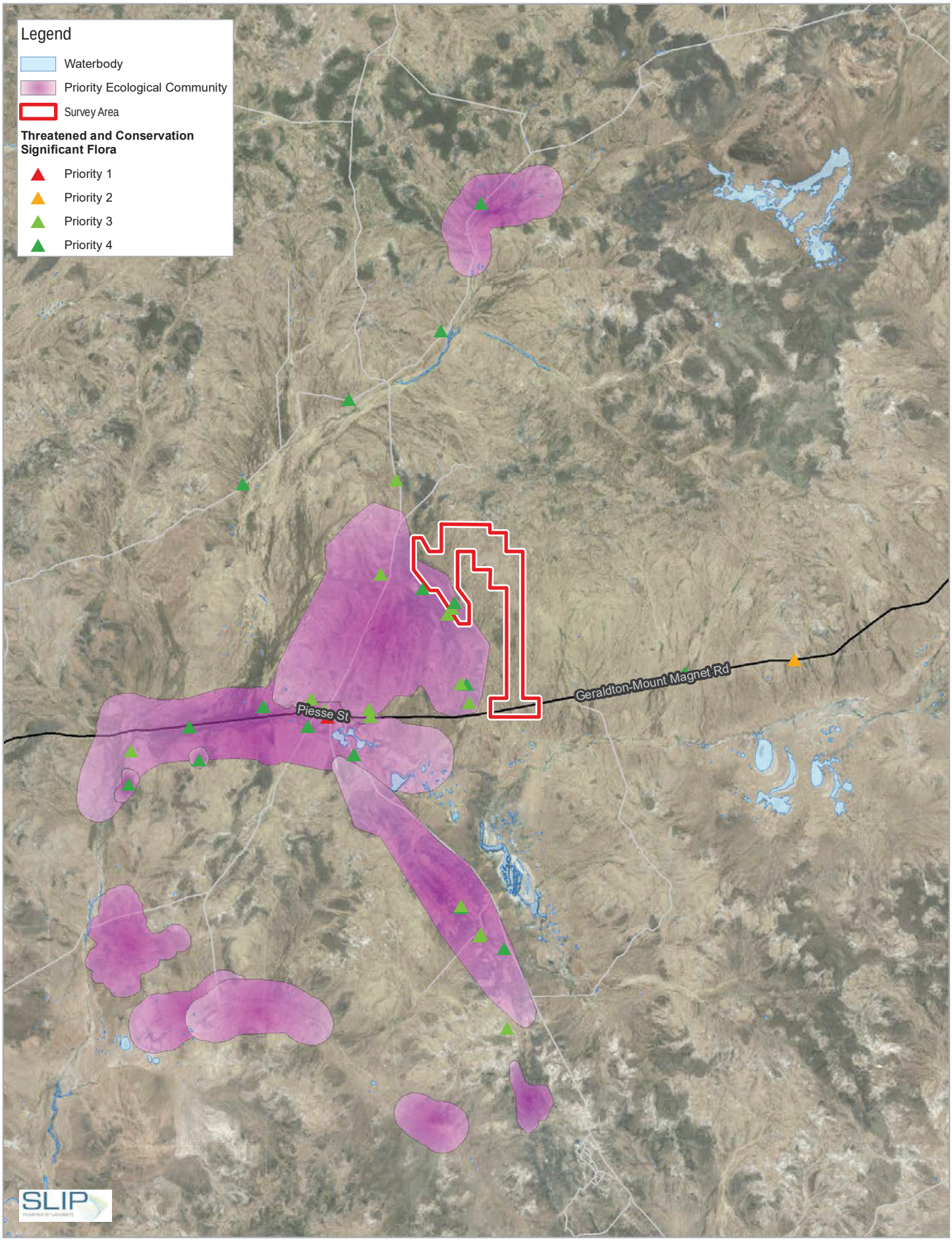
Two hundred and thirty flora taxa (including subspecies and varieties) representing 51 families and 121 genera were recorded from the survey area. This total comprised of 223 native taxa and 7 introduced flora taxa. Dominant families recorded from the survey area included: Fabaceae (45 taxa), Chenopodiaceae (19 taxa) and Scrophulariaceae (18 taxa).

Conservation significant flora

No EPBC Act or *Biodiversity Conservation Act 2016* (WA) (**BC Act**) listed flora were recorded within the survey area. Three DBCA Priority-listed flora species were recorded within the survey area during the field survey which included the following: *Acacia subsessilis* (Priority 3), *Acacia speckii* (Priority 4) and *Dodonaea amplisemina* (Priority 4).

Introduced flora

Seven introduced flora taxa were recorded in the survey area. Of the introduced taxa, none are listed as Declared Pests under the *Biosecurity and Management Act 2007* and/or as a Weeds of National Significance. All of the introduced flora have been previously recorded from the Yalgoo IBRA bioregion.



Paper Size ISO A4

0 5 10

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

FI Joint Venture Pty Ltd
Yogi Flora Survey

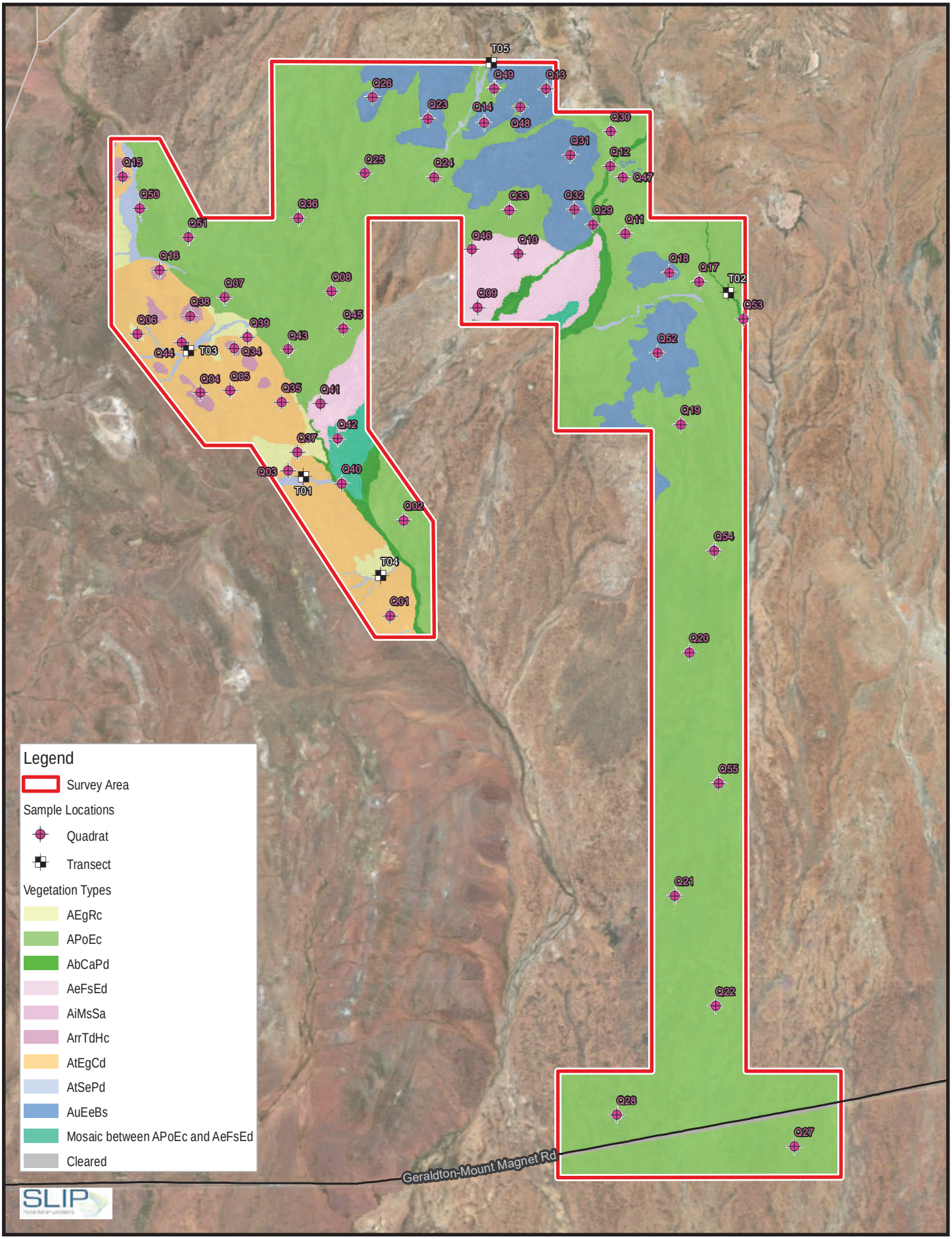
Biological Constraints

Project No. 61- 37117
Revision No. A
Date 25 Mar 2019

FIGURE 7-13

G:\61\37117\GIS\Maps\Working\Flora\6137117_003_BiologicalConstraints_RevA.mxd
Print date: 25 Mar 2019 - 10:11

Data source: GHD: Survey Area - 20180622, Bat detector locations, Trapsites, Camera locations, Night parrot Detectors - 20181210; Landgate: Roads - 20181023, Imagery - Taken September 2012 - Accessed 20181210 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: krawlinson



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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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FI Joint Venture Pty Ltd
Yogi Flora Survey

Vegetation Types

Project No. 61-37117
Revision No. A
Date 14 May 2019

FIGURE 7-14

G:\61\37117\GIS\Maps\Working\Flora\6137117_005_VegType_RevA.mxd
Print date: 14 May 2019 - 11:12

Data source: GHD: Survey Area - 20180622, Sample Locations - 20190507, Vegetation Types - 20190514; Landgate: Roads - 20181023, Imagery - Taken September 2012 - Accessed 20181210 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: artermulo

Flora assessment of pipeline corridor

A flora desktop assessment and field surveys (reconnaissance flora and Level 1 fauna) (November 2018) have been undertaken of the PDE. The survey area assessed included approximately 80 km of the pipeline corridor, extending from the Yogi Mine Project to east of Mullewa. The survey area is approximately 500 meters (m) wide and covers 4,655 hectares (ha). A summary of the results are presented in the below sections and further details can be obtained from the report (GHD 2019f) which is stated in the References list (Section 14).

The ecological constraints for the pipeline corridor as determined by the desktop assessment component of the flora assessment is presented in Figure 7-15.

Vegetation condition

The survey area comprised approximately 316.07 ha of cleared areas, with the remaining vegetated land comprising 21 vegetation types ranging from Very Good (110.10 ha) to Excellent (4228.79 ha) condition. The vegetation types included five woodland and 16 shrubland types. Areas rated as Very Good had signs of historical grazing with other disturbances including historical clearing for tracks and material gravel pits, and recent fire activity only affecting one vegetation type.

Conservation significant ecological communities

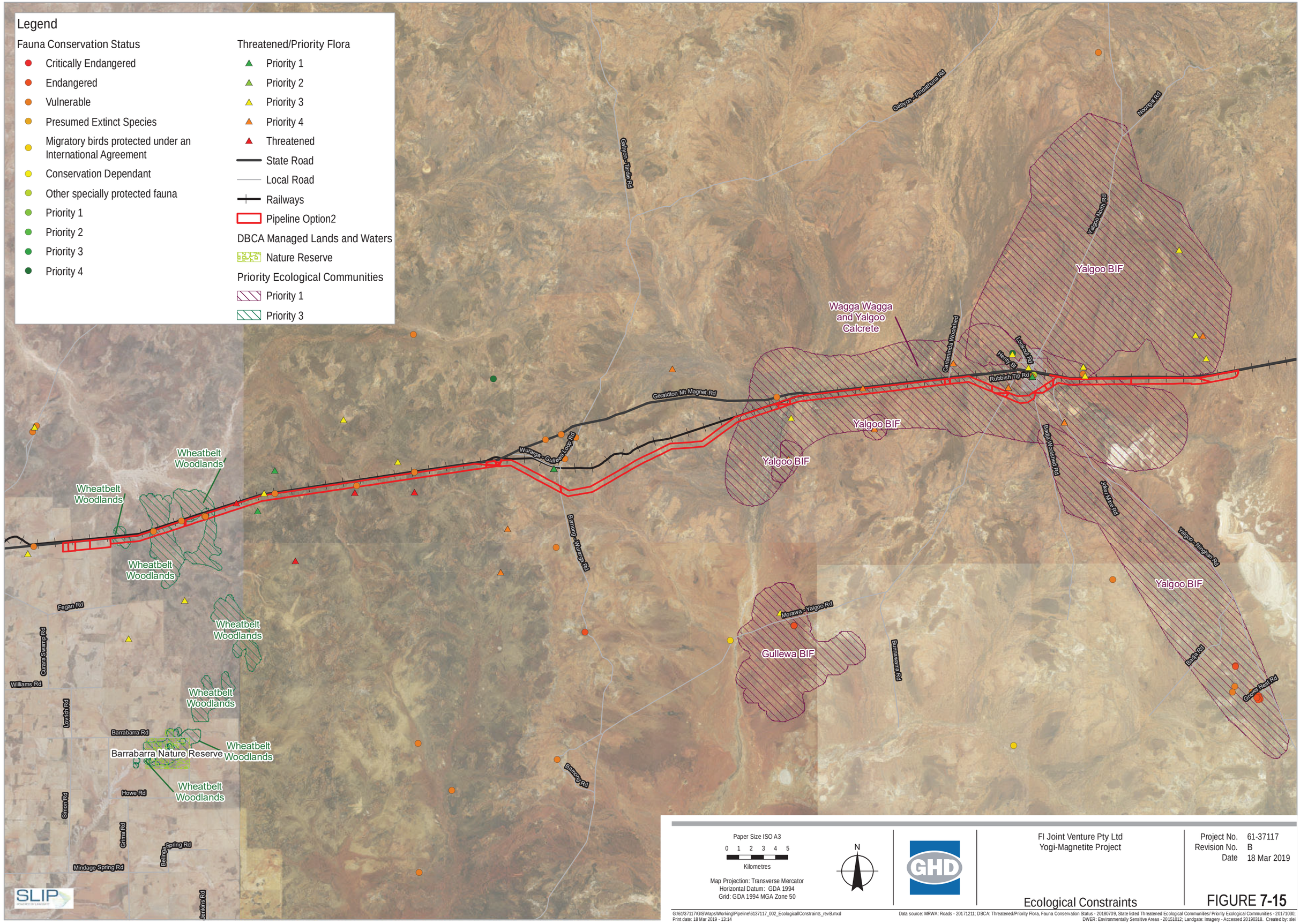
The field survey confirmed the presence of a PEC, the Eucalypt Woodlands of the WA Wheatbelt, listed as Priority 3 by DBCA. Vegetation Type 17 *Eucalyptus loxophleba* subsp. *supralaevis* open mallee woodland to woodland represents the PEC based on the nomination advice (DEC 2011), which lists *Eucalyptus loxophleba* as one of the dominate species that forms the PEC in the Avon Wheatbelt IBRA bioregion. There is 277.35 ha of this PEC in Excellent condition within the survey area.

Flora diversity

Ninety three flora species were identified during the survey with the most commonly recorded families including Fabaceae, Chenopodiaceae, Amaranthaceae and Myrtaceae. No Declared Pest plants or Weeds of National Significance were recorded during the survey.

Conservation significant flora

No *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or *Biodiversity Conservation Act 2016* (BC Act) listed flora were recorded within the survey area. Three DBCA Priority-listed flora species were recorded during the survey, *Philotheca nutans* (Priority 1), *Dicrastylis linearifolia* (Priority 3) and *Acacia speckii* (Priority 4). *Philotheca nutans* was not identified in the desktop searches, however it was identified in the field and confirmed by the WA Herbarium. This represents a range extension for the species of approximately 150 km. A further three species are considered likely or may possibly occur within the survey area based on a likelihood of occurrence assessment.



Paper Size ISO A3

0 1 2 3 4 5

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

FI Joint Venture Pty Ltd
Yogi-Magnetite Project

Project No. 61-37117
Revision No. B
Date 18 Mar 2019

Ecological Constraints

FIGURE 7-15

G:\61\37117\GIS\Maps\Working\Pipeline\6137117_002_EcologicalConstraints_revB.mxd
Print date: 18 Mar 2019 - 13:14

Data source: MRWA: Roads - 20171211; DBCA: Threatened/Priority Flora, Fauna Conservation Status - 20180709, State listed Threatened Ecological Communities/ Priority Ecological Communities - 20171030; DWER: Environmentally Sensitive Areas - 20151012; Landgate: Imagery - Accessed 20190318. Created by: slei

7.3.7 Terrestrial fauna

Previous terrestrial fauna surveys

Two fauna surveys were previously undertaken within sections of the MDE. The key findings of these surveys are summarised in Table 7-9.

Table 7-9 Key findings of previous fauna surveys completed within MDE

Previous survey/assessment	Location and key findings
ATA Environmental (2006) Vertebrate Fauna Assessment, Yalgoo Iron Project	Location: Leases P59/1397, E59/642 and P59/108 ATA conducted a desktop and Level 1 fauna assessment and found: • One habitat type – scattered mulga • Three conservation significant species may visit the project location including Gilled Slender Bluetongue (*Cyclodomorphous branchialis*) and Peregrine Falcon (*Falco peregrinus*) • No inventory species records were available in this report
Coffey Environments Pty Ltd (2008) Vertebrate Fauna Survey Yalgoo Iron Ore Project	Location: Mining Tenements E59/642, M59/637 and P59/1397. Coffey conducted a level 2 fauna survey that included a trapping program, avifauna, opportunistic survey and bat survey. The key findings include: • Two broad habitat types – Tall Shrubland and Tall Open Scrubland • Degraded habitat due to sheep grazing • The survey recorded 3 amphibians, 29 reptiles, 34 birds, 16 mammals

Terrestrial fauna assessment of the mine site

A level 1 reconnaissance fauna survey (August 2018) and a level 2 trapping program (October 2018) of the MDE was undertaken. The field survey covered 8,230 ha and a desktop assessment was undertaken prior. A summary of the results are presented in the below sections and further details can be obtained from the terrestrial fauna assessment report (GHD 2019g) which is stated in the References list (Section 14).

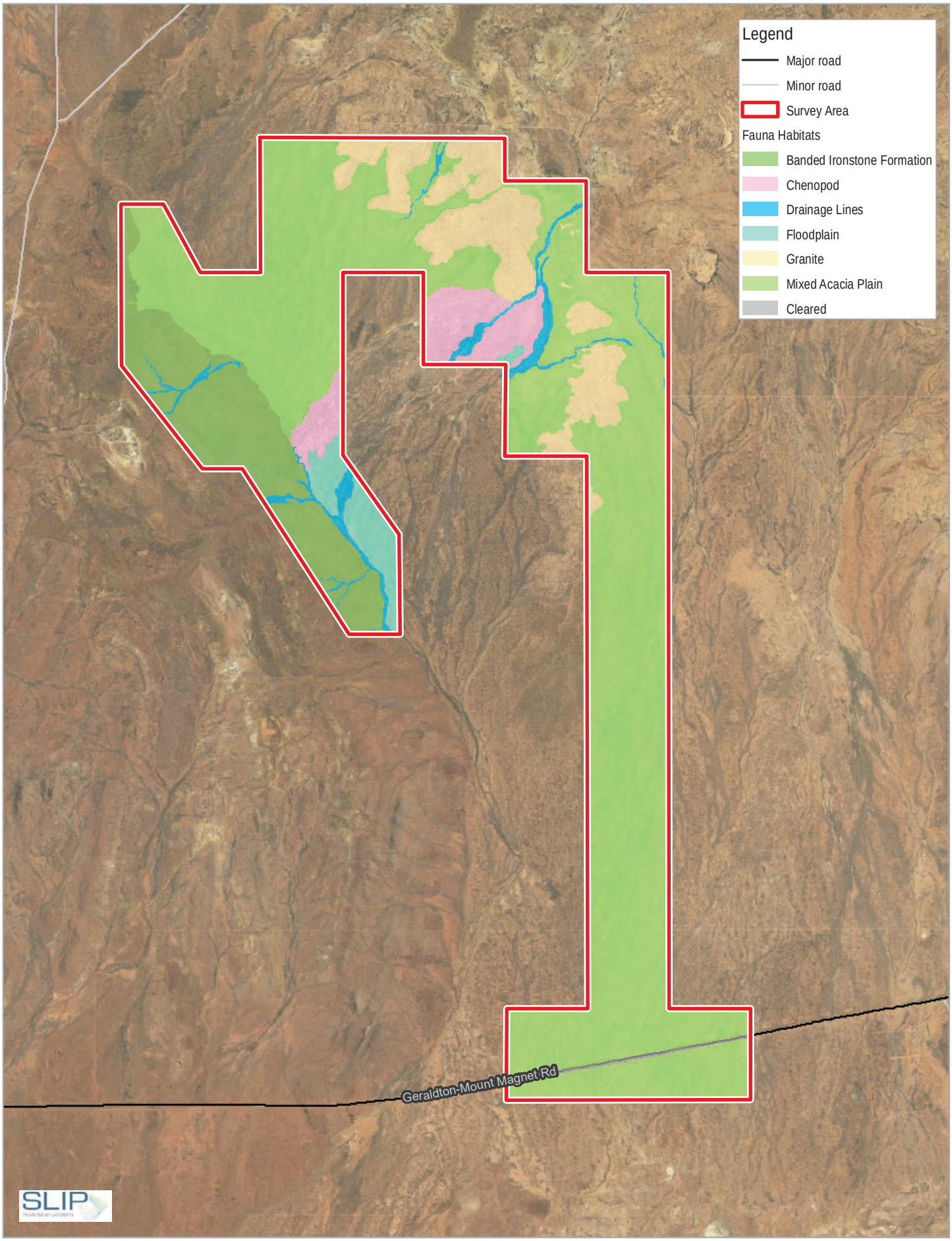
Fauna habitats

The study area consists of six broad fauna habitat types listed below. A very small amount of the Study Area is disturbed and comprises of existing tracks, old fencing and historical cleared areas for stock water points. The conservation value of each habitat type has been rated based on condition, structural complexity, faunal diversity and habitat for conservation significant fauna (i.e. contains essential habitat for breeding and/or feeding). Habitat values for the six types are all considered high to moderate value

- Banded Ironstone Formation (BIF) Ridgelines - moderate value
- Riparian/Creek line – high value
- Flood Plain – moderate value
- Chenopod Plain – high value
- Mixed Acacia Plain – moderate value
- Granitic formations – high value

Figure 7-16 presents the distribution of the major fauna habitat types within the MDE.

Further descriptions of the major fauna habitat types are presented in Appendix B.



Paper Size ISO A4

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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FI Joint Venture Pty Ltd
Yogi Fauna Survey

Fauna Habitats

Project No. 61-37117
Revision No. 0
Date 14 May 2019

FIGURE 7-16

G:\61\37117\GIS\Maps\Working\Yogi Fauna Survey (613711703)\6137117_004_FaunaHabitats_rev0.mxd
Print date: 14 May 2019 - 16:57

Data source: GHD: Survey Area - 20180622, Fauna Habitats - 20181210; Landgate: Roads - 20181023, Imagery - Taken September 2012 - Accessed 20181210.. Created by: artermulo

Fauna diversity

The GHD surveys recorded 148 vertebrate fauna species utilising the survey area, including 23 mammals, 84 birds, 37 reptiles and four amphibians.

Conservation significant fauna

Western Spiny-tailed Skink

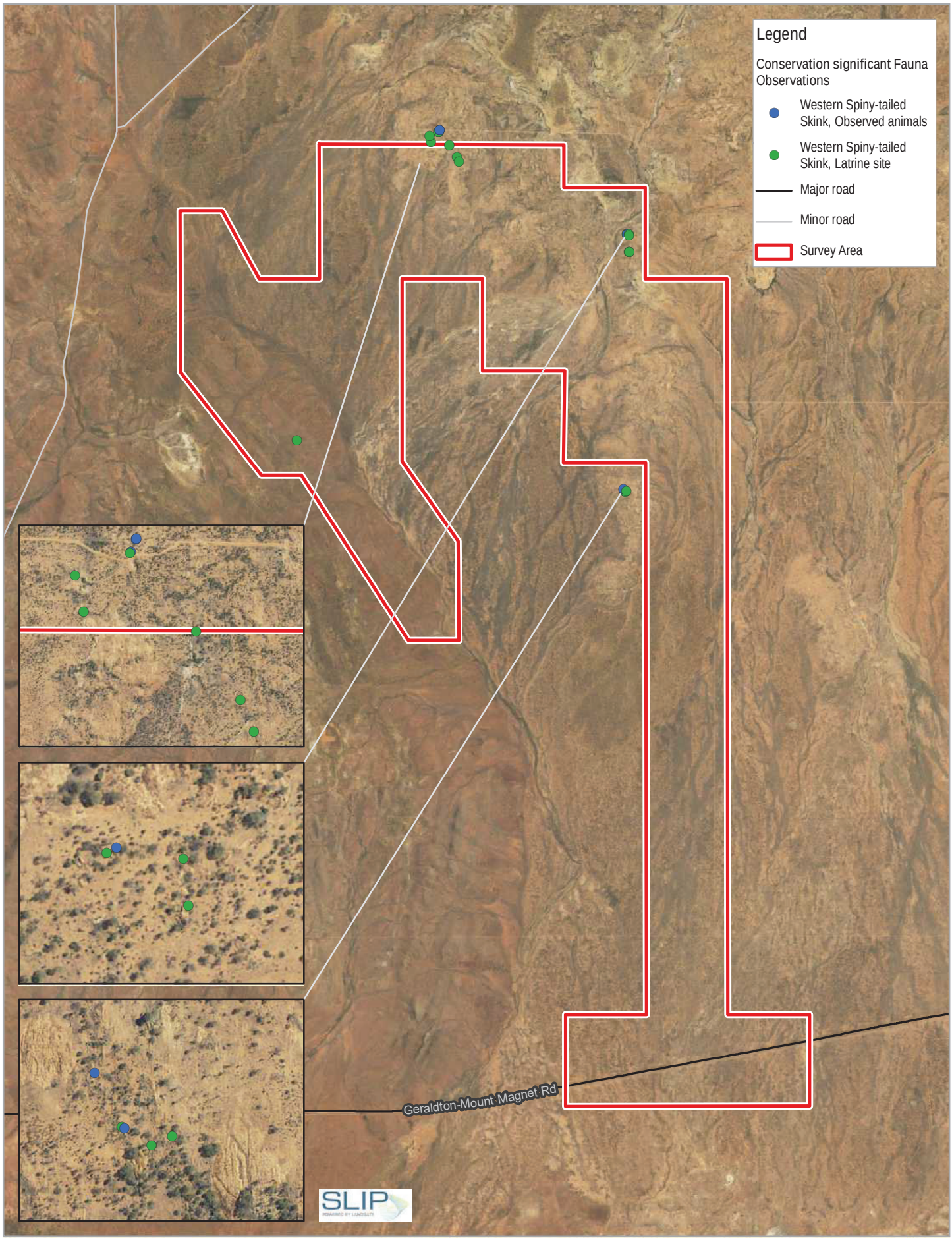
One conservation significant fauna species was recorded within the survey area during the field survey. This species was the Western Spiny-tailed Skink (*Egernia stokesii subsp. badia*), which is listed under Schedule 3 (Vulnerable) of the BC Act and Endangered under the EPBC Act (Figure 7-17).

Figure 7-17 Adult Western Spiny-tailed Skink in granitic habitat (GHD 2019g)

During the field survey four broad locations recorded the Western Spiny-tailed Skink. Three locations were present in granitic areas with one latrine site identified within the BIF formation. Records included actual individual observations or signs of the species via the presence of latrine sites. All observations have been mapped and are presented in Figure 7-18.

Observations of animals was between one and five animals at each location, with two locations recording juveniles as well as adults. Camera traps recorded activity at the most northern site (along the northern boundary of the survey area) which consisted of basking (adults and juveniles) and mating or territorial male behaviour.

It is recommended that additional assessment for Western Spiny-tailed Skink should be undertaken within the survey area. The proposed work would also identify potentially suitable sites to relocate individuals that may be affected.



Paper Size ISO A4

0 1 2 3 4

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

FI Joint Venture Pty Ltd
Yogi Fauna Survey

Fauna Results

Project No. 61-37117
Revision No. 0
Date 25 Mar 2019

FIGURE 7-18

G:\61\37117\GIS\Maps\Working\Yogi Fauna Survey (6137117703)\6137117_005_FaunaResults_rev0.mxd
Print date: 25 Mar 2019 - 16:36

Data source: GHD: Survey Area - 20180622, Threatened Fauna - 20181210; Landgate: Roads - 20181023, Imagery - Taken September 2012 - Accessed 20181210.. Created by: bjones2

Other fauna species likely to be in the survey area

Three other species are likely to be present in the survey area based on previous records in the region and habitat present, these species are:

- Peregrine Falcon (*Falco peregrinus*) – Other special Protection under the BC Act.
- Gilled Slender Bluetongue (*Cyclodomorphis branchialis*) – Vulnerable under the BC Act.
- Long-tailed Dunnart *(Sminthopsis longicaudata*) – Priority 4, DBCA

Terrestrial fauna assessment of the pipeline corridor

A fauna desktop assessment and field surveys (reconnaissance flora and Level 1 fauna) (November 2018) have been undertaken of the PDE. The survey area assessed included approximately 80 km of the pipeline corridor, extending from the Yogi Mine Project to east of Mullewa. The survey area is approximately 500 meters (m) wide and covers 4,655 hectares (ha). A summary of the results are presented in the below sections and further details can be obtained from the report (GHD 2019e) included in the References list (Section 14).

The ecological constraints for the pipeline corridor as determined by the desktop assessment component of the flora and fauna assessment is presented in Figure 7-15.

Fauna habitat types

Eight broad fauna habitat types recorded during the field survey (excluding area considered cleared and degraded). The survey area habitats form part of a large continuous tract of habitat. The habitats have been impacted to some degree by tracks, grazing livestock and feral animals. Parts of the survey area were also impacted by historical gravel pits and a historical railway line. While the structural complexity of some habitat types show stress signs of grazing and reduced water availability, the majority of the site is uncleared and represents good, intact habitat.

Fauna diversity

Fifty-six fauna species were recorded from the survey area, including 47 birds, six mammals and three reptiles; of these five were introduced species.

Conservation significant fauna

No conservation significant fauna were recorded during the survey.

Fauna likelihood of occurrence assessment

A likelihood of occurrence assessment was conducted post-field survey for all conservation significant fauna identified in the desktop assessment. The assessment identified the likely presence of the Malleefowl (*Leipoa ocellata*), listed as Vulnerable under the BC Act and EPBC Act), Gilled Slender Blue-tongue (*Cyclodomorphus branchialis*), listed as Vulnerable under the BC Act, Western Spiny-tailed Skink (black form) (*Egernia stokesii* subsp. *badia)*, listed as Vulnerable under the BC Act and Endangered under the EPBC Act) and the Long-tailed Dunnart (*Sminthopsis longicaudata)*, listed as Priority 4 by DBCA, as the survey provides suitable habitat for these species.

Short range endemic fauna assessment

A desktop assessment and field survey was undertaken for short range endemic invertebrates (**SRE**) in the MDE in October 2018. A summary of the results are presented in the below sections and further detail can be obtained from the report (Invertebrate Solutions 2019a) included in the References list (Section 14).

Desktop assessment

A search of the Western Australian Museum (**WAM**) databases for potential SRE taxa occurring in the desktop study area centred on the Project area to the north east of Yalgoo was undertaken. The desktop study area comprised a rectangle of approximately 50 km sides bounded by the north west corner (28.00°S, 116.60°E) and the south east corner (28.50°S, 117.03°E) centred on the Yogi magnetite project. No mollusc records are present in the WAM. It was determined that the desktop study area contains one Confirmed SRE species, an Antichiropus millipede and two Possible SRE species (one olpiid pseudoscorpion and one trapdoor spider). The remainder of the species were found to be widespread.

Field survey results

The SRE field survey recorded 23 taxa of invertebrates from three classes, nine orders and ten families that have the potential to contain SRE taxa (presented in Table 7-10). There were no 'Confirmed' SRE species recorded during the survey. A single 'Likely' SRE species (*Cubaris*? sp. indet.) was recorded during the survey. The SRE survey recorded 12 taxa identified as "Possible" SRE species. This is primarily due to the groups being considered data deficient, and the absence of other systematic collections in the local area making the assignation of SRE status difficult using the data from a single field survey. Almost all the Possible SRE species were found at multiple locations during the survey indicating that their distributions are wider than the current survey could determine. Most species were found to be widespread in the semi-arid Murchison and Yalgoo regions or more widely. The Yalgoo region has not be the subject of many previous collections, especially systematic surveys compared with other parts of the Yilgarn and Pilbara and so the distributions of many species are unknown from this area apart from isolated historical records.

Table 7-10 Invertebrates recorded during field survey and examined for SRE status (Invertebrate Solutions 2019a)

Higher Order	Genus and species	SRE Status
Crustacea: Isopoda: Armadillidae	*Buddelundia sp. indet.* *Cubaris?* sp. indet. *Porcellio sp. indet.*	Possible (A) Likely Widespread
Arachnida: Mygalomorphae: Nemesiidae Pseudoscorpiones: Olpiidae		
	Aname mellosa?	Widespread
	Ambyolpium sp. 'IS01'	Possible (A)
	Beierolpium sp '8/3'	Possible (A)
	Beierolpium? sp.	Possible (A)
	Euryolpium? sp.	Possible (A)
	Euryolpium granulosum?	Possible (A)
	Indolpium sp 'IS04'	Possible (A)
Scorpiones: Buthidae	*Isometroides vescus*	Widespread
	Lychas sp 'IS02'	Possible (A)
Scorpiones: Urodacidae	*Urodacus hoplurus*	Widespread
Chilopoda: Scolopendromorpha: Scolopendridae	*Arthrorhabdus mjobergi*	Widespread
	Arthrorhabdus cf. mjobergi	Possible (A)
	Scolopendra laeta	Widespread
	Scolopendra mositans	Widespread
Geophilomorpha: Oryidae	*Orphnaeus brevilabiatus*	Widespread
Geophilomorpha: Mecistocephalidae	*Mecistocephalus sp. IS02 '47 legs'*	Possible (A)
Scutigeridomorpha: Scutigeridae	*Pilbarascutigera cf. incola*	Possible A
Diplopoda: Polyxenida: Polyxenidae		
	Unixenus karajiniensis	Widespread

Higher Order	Genus and species	SRE Status
	Unixenus cf. karajiniensis	Possible (A)

7.3.8 Subterranean fauna

Phase 1 survey

A desktop assessment and a dual phase field survey for subterranean fauna (stygofauna and troglofauna) in the MDE was completed in August 2018. A summary of the results are presented in the sections below and further details can be obtained from the report (Invertebrate Solutions 2019b) which is stated in the References list (Section 14).. Stygofauna (aquatic subterranean dependent species) and troglofauna (air breathing subterranean dependent species) are known to occur widely in the Pilbara, Yilgarn and Ngalia basins.

Desktop assessment

No previous records of troglofauna were found to be present in the databases of the WAM from within the desktop study area. However, suitable habitat for troglofauna is highly likely to occur in calcrete areas to the south of the Geraldton Mt Magnet Rd where the upper unsaturated portions of the calcrete provide suitable conditions for troglofauna in the extensive interconnected void networks found in calcrete outcrops. The BIF located in the pit void has a moderate likelihood based on other BIF outcrops in the region.

No previous records of stygofauna are present in the databases of the WAM for the desktop study area. However, five stygofauna communities, all listed as Priority 1 Ecological Communities are known to occur in the calcrete areas in the region (Badja, Bunnawarra, Gabyon, Muralgarra, Wagga Wagga and Yalgoo). All these calcretes were listed due to the presence of stygobiont Dytiscid diving beetles that occur in virtually every calcrete in the Mid West. Table 7-11 summarises the suitability of geological units for the presence of subterranean fauna within the MDE.

Table 7-11 Geological units within MDE and their suitability for subterreanean fauna (Invertebrate Solutions 2019b)

Unit	Description / Remarks	Subterranean Fauna Suitability
Alluvium	Mixed gravel, silt and sand alluvium	Moderate for stygofauna if within the saturated zone. Low for troglofauna.
Calcrete	Badja, Bunnawarra, Gabyon, Muralgarra, Wagga Wagga and Yalgoo Calcretes.	High/Definite for stygofauna High for troglofauna (above watertable)
Palaeochannel	Moore and Murchison palaeodrainage systems	Moderate/High Stygofauna Nil for troglofauna (below watertable)
BIF	Medium grained dolerite	Moderate for stygofauna Moderate for troglofauna (above watertable)
Granites	Porphyritic granite to adamellite, overprinting with mafic minerals	Low for stygofauna. Low for troglofauna (above watertable).

Field survey results

Stygofauna

The phase 1 stygofauna survey recorded six species and 155 individuals of stygofauna from six of the 22 bores sampled within the alluvial aquifers accessible within the Project area using available stock wells and vertical bores.

No vertical bores were within the proposed mining pit at the time of sampling and therefore no stygofauna net haul samples were able to be undertaken in the Phase 1 survey within the pit void area.

From the samples two classes, three orders, three families and six genera were identified and summarised in Table 7-12. The greatest diversity was among the copepods with two orders, two families, four genera and four species recorded. Two significant findings from the survey included:

- a new copepod species (*Schizopera yalgoo* n. sp.) from a single locality that is likely endemic and
- the first ever male specimen of a copepod species found in Australia that is typically known to be found as predominantly female populations.

Table 7-12 Stygofauna recorded during August 2018 field survey (Invertebrate Solutions 2019b)

Higher Order	Genus and species	Notes
Crustacea: Ostracoda: Podocopida: Cyprididae	*Sarscypridopsis ochracea*	Known from South Africa and Western Australia. First ever male specimens from Australia
	Cyprididae sp.	Juvenile specimens, identification requires adults (probably *Sarscypridopsis ochracea*)
Crustacea: Copepoda: Cyclopoida: Cyclopidae	*Apocyclops dengizicus*	Cosmopolitan.
	Mesocyclops brooksi	Widespread, stygophilic species
	Metacyclops laurentiisae	Found throughout Murchison region of WA, stygophilic species
Crustacea: Copepoda: Harpacticoida: Miraciidae	*Schizopera yalgoo n. sp.*	New species, likely endemic

Troglofauna

The phase 1 troglofauna survey recorded three specimens recorded two isopods and one polyxenid millipede, which are summarised in Table 7-13. Two specimens of an undescribed Philoscid isopod were recorded. The specimens exhibit troglomorphic characters including loss of pigmentation and reduced eyes that would indicate that the species is an obligate subterranean form.

Table 7-13 Troglofauna recorded during October 2018 (Invertebrate Solutions 2019b)

Higher Order	Genus and species	Notes
Crustacea: Isopoda: Philosciidae?	Philosciidae sp. 'yalgoo'	Undescribed species with troglomorphic characters present indicating an obligate subterranean species.
Myriapod: Diplopoda: Polyxenida	*Unixemus sp.*	Surface species with likely wide distributions

7.3.9 Waste materials

Materials characterisation assessment

A materials characterisation assessment was undertaken to understand the leaching potential, particularly acid and metalliferous drainage (**AMD**), of the Project's future waste rock dumps. The desktop assessment has analysed publicly available information, as well as FIJV information, such as a mineralogical, geological and assay data. Data was available from the

hanging wall, orebody and footwall components of the geology. The materials characterisation assessment concluded that the qualitative information indicates that the issues relating to the risks of acidic, metalliferous and saline drainage, radioactivity and asbestos appear to be low however that additional data, particularly from the hanging wall and some footwall materials is necessary to sufficiently characterise the risk, likelihood of adverse impacts and management requirements. A summary of the results from the materials characterisation assessment are presented in the below sections and further detail can be obtained from the report (GHD 2019h) which is stated in the References list (Section 14).

Characterisation of leaching impacts

Assessment of acid potential

The ore body and waste material exhibits relatively low concentrations of sulphur, assumed as sulphide (0.11% S), as shown in Table 7-14 which presents the sulphur statistics data. Given the sulfur concentrations, the risk that strong acidic conditions could develop is probably unlikely, however, further data/information is required to quantify the buffering capacity, and provide confidence that acidic conditions will not prevail at concentrations that will cause concern.

There is no relevant data relating to the presence of carbonate (or other indicators of carbonate) within the waste-rock or ore materials. Given the lack of carbonate assay data, the concentrations of carbonate are for the purposes of the study are deemed as zero, and as a consequence the acid neutralising capacity (**ANC**) is deemed as zero (see Equation 1).

Based on Equation 1, the calculated values of Maximum Potential Acid (**MPA**) is 3.36 kg H_2SO_4/ tonne (given that carbonate is deemed zero,) and the Net Acid Production Potential (**NAPP**) is also deemed at 3.36 kg H_2SO_4/ tonne for both the waste-rock and the ore.

The Department of Industry, Tourism and Resources (**DITR**) (2007) guidelines on AMD indicate that based on this value (3.36 kg H_2SO_4/ tonne) the waste rock and the ore material are classified as “Potentially Acid Forming – Low Capacity”.

This is an apparent classification, until such time as the carbonate concentrations are characterised within the waste rock and ore, at which point the material may be reclassified.

Equation 1:

NAPP (kg H_2SO_4 / tonne) = **MPA** [% Total S * 30.6] – **ANC** [(%CaO * 17.5) + (%MgO * 24.3)]

Table 7-14 Summary of sulphur (%) occurrence based on rock type (GHD 2019h)

Rock ID	Count	Minimum	Maximum	Average
Waste rock:				
Felsic	431	0.001	5.46	0.15
Mafic	224	0.001	0.49	0.08
Misc	25	0.001	0.52	0.06
Pyroxenite	3	0.002	0.02	0.01
Regolith	40	0.001	0.41	0.03
Sedimentary	32	0.001	0.04	0.01
Talc-chlorite	72	0.001	0.61	0.04
BIF (<20% Fe)	1747	0.001	5.32	0.11
Ore:				
BIF (>20% Fe)	3950	0.001	5.01	0.11

Assessment of metal leaching potential

The available metals data from the mineralogical database shows that a total of 12 metals and elements have been assayed within the ore and the waste rock.

The 12 metals and elemental average concentrations have been compared to the reference concentration (global abundance) to assess the relative enrichment, with the following results:

- Iron, silicon and aluminium and lead are relatively enriched in all waste rock types and ore material, at two to three times the reference concentrations.
- Chromium and nickel indicate relative enrichment in a few of the waste rock types associated with mafic composition (pyroxenite, talc-chlorite schist and BIF (< 22% Fe), and felsic units).
- Titanium enrichment is restricted to the regolith rock type, presumably as a consequence of deflationary style weathering.
- Zinc, copper and cobalt are not relatively enriched in all waste rock types and ore material.

Excluding the above 12 elements and metals, there is insufficient data/information with which to assess the occurrence of a number of other metals which may be of concern (e.g. arsenic, antimony, cadmium, barium, mercury, uranium etc).

Given the “Potentially Acid forming – Low Capacity” conditions assessed at the site, the risk of strong acidic conditions persisting is considered unlikely, and high concentrations of dissolved metals in groundwater are not anticipated. However, identified dissolved metals can occur at concentrations that may be of concern to the human health and the environment under mild acid conditions, which until testing confirms, cannot be excluded from developing in the waste rock and processed waste material.

Assessment of saline drainage potential

Although the detailed mineralogy of the waste rock is not available, the dominant iron and silicic mineralogy of the BIF and the volcanic nature of the footwall and hanging wall lithologies may preclude the presence of readily dissolvable minerals (e.g. halite, gypsum, carbonate, sulphur). Confirmatory testing is considered necessary to demonstrate that the risk of adverse saline impacts, derived from leaching from the waste rock and processed waste material is considered low.

Radioactivity

The geological setting of ore body and waste rock is commonly not associated with minerals and elements which exhibit elevated radioactivity (above that of background). This needs to be confirmed by measurements of radioactivity.

Any radioactive minerals or elements, which are present may be subject to enrichment within the processed waste material as a consequence of ore processing and mineral separation processes.

The radioactivity exposure risk from the waste rock material is considered to remain at background levels, excluding possible dust exposure and leaching risks, since the waste rock is not subject to processing.

Airborne hazards

Asbestos form minerals are not common to this geological setting. Confirmation that this be case is required through testing due to the possibility that asbestos may be associated with the occurrence of sheared ultramafic rocks (i.e. talc-chlorite schist)

The mineralogy and lithological type of the BIF style orebody (e.g. 50% silica/chert) requires that mining activities, waste rock dumps and processed waste storage facilities be managed to prevent the generation of air-bore silica at concentrations which may cause adverse impacts to human health.

7.3.10 Heritage

Aboriginal heritage

The *Aboriginal Heritage Act 1972* (**AH Act**) states it is an offence under this legislation to "excavate, destroy, damage, conceal, or in any way alter any Aboriginal site", without prior authorisation of the Registrar of Aboriginal sites and/or consent of the Minister for Indigenous Affairs.

Previous Aboriginal heritage surveys

Four Aboriginal heritage surveys were undertaken in areas intersecting the MDE and PDE by Western Heritage Research between 2006 and 2012 (EnviroWorks Consulting 2017). The sites identified in these surveys are presented in Figure 7-19.

Aboriginal heritage desktop assessment and due diligence risk assessment (2019)

An Aboriginal heritage desktop assessment and due diligence risk assessment of the MDE was undertaken by Brad Goode & Associates in 2019 (Brad Goode & Associates 2019a). The desktop assessment identified two lodged sites which intersect the MDE and they are presented on Figure 7-19: Yalgoo 1 (southeastern section of M59/637) and Yalgoo Creekline Scatters (southwestern section of L59/156). No registered sites intersect the MDE. The desktop assessment identified eight registered Aboriginal sites and 24 other heritage places that intersect the pipeline corridor. Further survey work was recommended from the study. Further detail on the Aboriginal heritage desktop assessment can be obtained from the report (Brad Goode & Associates 2019a) which is stated in the References list (Section 14).

Aboriginal heritage survey (2019)

An Aboriginal heritage survey of the MDE was undertaken by Brad Goode & Associates in 2019 (Brad Goode & Associates 2019b). The Aboriginal heritage survey comprised of an ethnographic and archaeological survey. A summary of the survey results are presented below and further detail on can be obtained from the Aboriginal heritage survey report (Brad Goode & Associates 2019a) which is included in the References list (Section 14).

Ethnographic survey

As a result of the ethnographic consultations held with four representatives from the Widi Mob WC1997/072 Native Title Claim group, no new ethnographic sites of significance, as defined by the AH Act were identified within the survey areas.

During the ethnographic survey the Widi NTC group representatives provided information on the cultural significance from mythological beliefs of waterways and other significant landscape features such as the hills. The waterways in the area were also defined by the Widi NTC group representatives to be significant as the Widi people followed and camped along them as they travelled and were an important resource for survival. Due to the defined significant cultural heritage values associated with the waterways and high landmark features located along the reported songline in the vicinity of the survey area, the Widi NTC group representatives requested that they be preserved and managed throughout the Project to ensure that they are not adversely impacted upon, such as through being removed or permanently altered for mining.

As a result of the ethnographic survey, Brad Goode & Associates (2019b) recommended the following:

- The Project does not risk breaching section 17 of the AH Act in relation to ethnographic Aboriginal heritage sites as defined by section 5 of the AH Act.

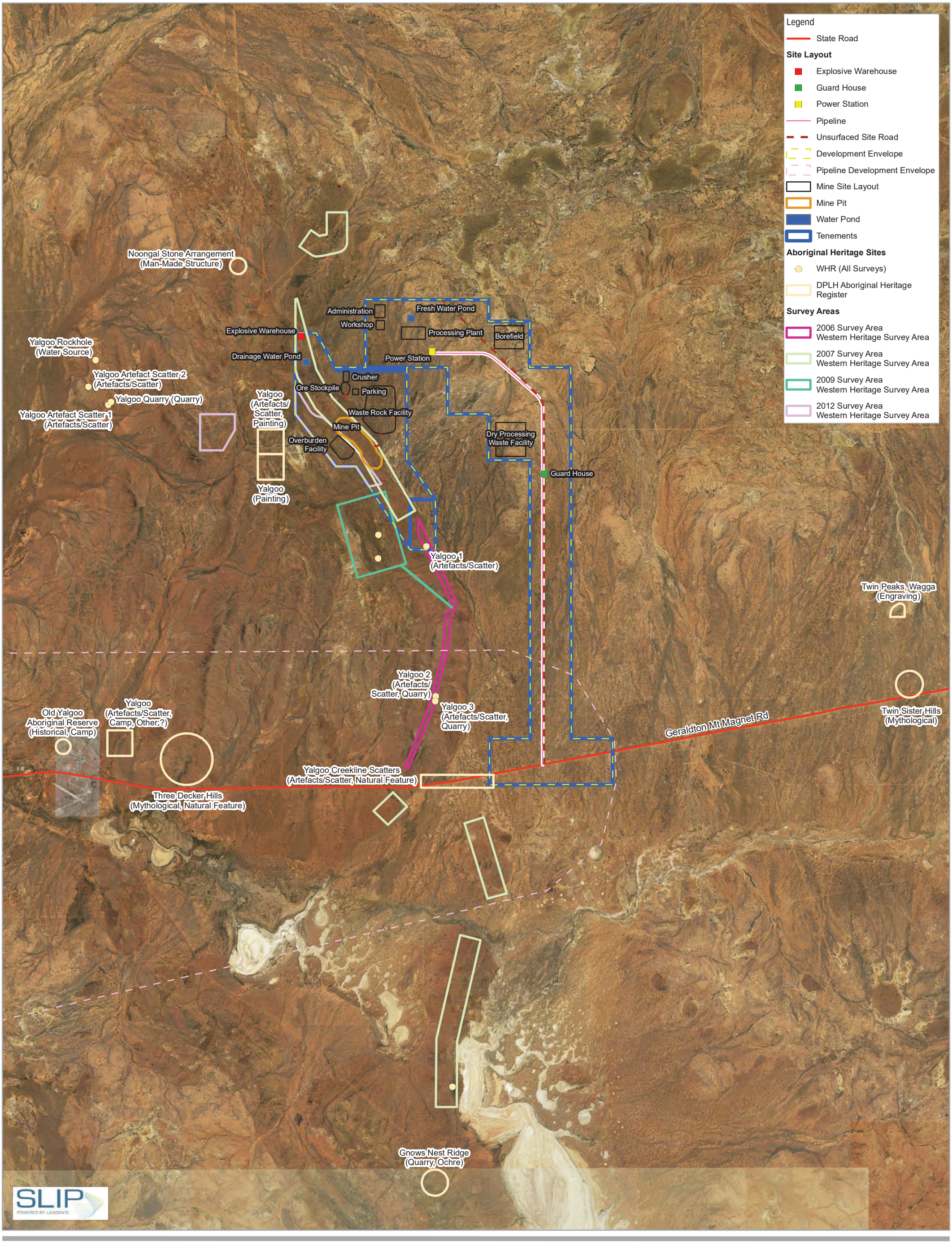
- Waterways and significant landform features in the survey area be preserved and managed throughout the life of the Project to ensure that they are not adversely impacted upon. If this is not possible then further consultations should be held with the Widi Mob WC1997/072 Native Title Claim group to minimise and mitigate the impact that the Project could have upon the cultural heritage values associated with such places.

Archaeological survey

No Aboriginal archaeological sites were identified during the archaeological survey of the MDE.

As a result of the archaeological survey, Brad Goode & Associates (2019b) recommended the following:

- The results of the archaeological survey be taken into consideration when FIJV seek approval to construct and operate the mine.
- In the event of any artefactual material or skeletal material being discovered in the course of constructing and/or operating the mine and associated infrastructure, or whilst undertaking any other activities, work should stop while the Department of Planning, Lands and Heritage (WA) carry out an investigation of the site.
- FIJV personnel and contractors be advised of their obligations under section 15 of the AH Act to report the discovery of any Aboriginal cultural material which may be uncovered in the course of their work.



Paper Size ISO A3

0 1 2 3 4

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

FI Joint Venture Pty Ltd
Yogi-Magnetite Project

Yogi Mine
Heritage Survey Extent

Project No. 61-37117
Revision No. A
Date 26 Jul 2018

FIGURE 7-19

G:\61\37117\GIS\Maps\Working\Yogi Mine\6137117_YogiMine_HeritageSurveyExtent_revA.mxd
Print date: 26 Jul 2018 - 17:57

Data source: MRWA: State Roads - 20171024; FIJV: Mine Tenements, Aboriginal Heritage Sites, Survey Areas, Development Envelope, Pipeline Development Envelope - 20171025; Landgate: Imagery.
Created by: artermulo

European heritage

According to heritage database searches undertaken by EnviroWorks Consulting (2017), there are no European heritage sites presented within the MDE. However, there are three European heritage sites present in the vicinity of the MDE (listed in Table 7-15).

Table 7-15 European heritage sites in the vicinity of the MDE

Site	Location	Heritage listing
Noongal Homestead and associated buildings	Carlawinda Pastoral Lease, 6 km north of MDE	Municipal Inventory (WA) (SHO-005), Heritage Council WA State Register
Carlawinda Station Homestead	8 km west of MDE	Municipal Inventory (WA) (SHO-005)
Several items associated with the historical railway	15 km south west of MDE	Municipal Inventory (WA) (SHO-005), Heritage Council WA State Register

7.3.11 Air quality

An air quality assessment was undertaken to determine the likely impacts from dust and other pollutants generated at the site as a result of the Project. A summary of the air quality assessment is presented in the below section and further details can be obtained from the report (GHD 2019i) which is stated in the References list (Section 14).

Air quality assessment

Modelling

The air quality assessment undertook modelling of two broad categories of emissions:

- Dust dispersion and deposition from mine operations
- Emission dispersion from the power station

Modelled pollutants included dust as total suspended particulates (**TSP**), particulate matter with an aerodynamic diameter of 10 microns or less (**PM_{10}**), particulate matter with an aerodynamic diameter of 2.5 microns or less (**$PM_{2.5}$**) and deposited dust, as well as oxides of nitrogen (**NO_2**), carbon monoxide (**CO**) and volatile organic compounds (**VOCs**) from the gas generators at the power station.

The town of Yalgoo was identified as the closest sensitive receptor to the Project. Three locations at the north-east edge of the town, approximately 14 km from the Project site boundary, were selected as sensitive receptors for modelling purposes. Due to the isolated location of the Project, there is no existing surrounding sources of pollution.

Results of the modelling showed that none of the predicted concentrations at the sensitive receptors exceeded the relevant assessment criteria. Therefore, the results in this assessment suggest it is unlikely that the Yogi Mine Project will have an adverse impact on local ambient air quality.

7.4 Analysis of environmental data for closure– knowledge gaps and further work

From a review of the environmental data available for the site, and in consideration of the four closure domains, the following priority data gaps have been identified in the environmental data forming the baseline for closure planning.

1. Assess the impact of hydrology on the mine layout. Determine whether hydraulic structures and/or watercourse diversions are required.
2. Conduct further materials characterisation data of the waste rock and ore.
3. Conduct fieldwork (fauna surveys, flow characteristics) to further characterise the baseline environment.

These key data gaps are planned to be closed out before the next revision of this MCP.

8. Identification and management of closure issues

8.1 Materials characterisation

The desktop AMD assessment undertaken by GHD (2019f), summarised in Section 7.3.9, concluded that the issues relating to the risk of acidic, metalliferous and saline drainage, radioactivity and asbestos appear to be low. The waste rock and ore material are classified as "Potentially Acid forming – Low Capacity" based on DITR (2007) guidelines.

However, it was also concluded that there is insufficient data to adequately characterise the risk and likelihood of adverse impacts and management requirements. Therefore further materials characterisation data of the waste rock ore through laboratory testing is required to be obtained to inform both mine construction/operations and closure planning.

8.2 Contaminated sites

DWER's Contaminated Sites Database allows searches for potentially contaminated sites within the MDE. A search of the database (on 21 February 2019) indicated that there are no known contaminated sites within the MDE.

There is the potential for contamination to occur over the life of the mine. Potential contamination has been considered when assessing closure issues in the risk assessment (Section 8.3). Should contamination occur, investigation and remediation will be in compliance with the *Contaminated Sites Act 2003* and the *Contaminated Sites Regulations 2006.*

8.3 Risk assessment

8.3.1 Risk assessment process

A desktop risk assessment has been completed for the rehabilitation and closure of the mine site. FIJV intends to involve stakeholders in a risk workshop prior to the construction of the mine.

The risk assessment utilises the categories as presented in Table 8-1. The risk assessment process has involved the identification of specific causes and potential impacts of risks. With the consideration that the risk is uncontrolled, the inherent "likelihood", "consequence" and "risk" ratings have been given. Specific control measures and person/s responsible for implementing the control measures and were then identified and based on the consideration of these control measures, the residual "likelihood", "consequence" and "risk" ratings were given. The person/s responsible for implementing the control measures were also identified.

The Project closure risk register that has been developed is presented in Appendix D. The risk assessment framework, including the definitions of likelihood and consequence criteria, as well as the risk rating matrix are also included in Appendix D.

Table 8-1 Risk assessment categories

Category	Rating
Inherent (Uncontrolled) Likelihood	Probability of impact occurring without controls: - Rare - Unlikely - Possible - Likely - Almost certain

Category	Rating
Residual (Controlled) Likelihood	Frequency of the impact after all controls measures are considered: - Rare - Unlikely - Possible - Likely - Almost certain
Consequence	Severity of the impact on the environmental factor: - Insignificant - Minor - Moderate - Major - Catastrophic
Risk Rating (Inherent / Residual)	Overall severity of the risk: - Extreme - High - Medium - Low

FIJV considers the closure risk register to be a live register which will be subject to ongoing management and review of risks throughout the life of the Project. The risk assessment will be reviewed during each phase of the Project and amended if it is required. It will be important to ensure that mitigation strategies have been implemented appropriately and are effective, as well as to determine if there are any new risks present that are relevant to closure. Updates to the risk register will be reported to DMIRS through the annual reporting cycle and future MCPs.

8.3.2 Risk assessment results

The inherent post-closure risks ranked as having the highest potential severity and likelihood for the Project were associated with pit lake water quality (if a pit lake is present onsite post-closure), waste landforms and the achievement of revegetation targets consistent with the post-mining land use closure objectives.

Table 8-2 summarises the risks initially ranked as “High” from the evaluation of inherent closure risks and includes the revised residual risk rating after the controls were implemented as presented in Appendix D. It is noted that there are no risks that were determined to have an inherent risk rating of “Catastrophic”.

The residual risk ratings in Table 8-2 show that all inherent risks would be reduced after the implementation of the proposed control measures were considered.

It is recognised that the risk assessment will be revisited throughout the life of the Project and therefore the Project risks and their ratings may be updated in the future to reflect increased knowledge.

Table 8-2 Summary of “high” inherent (uncontrolled) risks and residual (controlled) risk ratings

Domain/s	Risk Issue	Risk Rating	
		Inherent	Residual
Mine Pit	Contamination of surface water, groundwater and soil onsite/offsite by pit lake water (if pit lake is present onsite post-closure)	High	Medium
Mining Overburden and Waste Facilities Processing Waste Contaminant Facility	Landform instability – slope failure/erosion	High	Medium
	Leaching from hazardous materials within landforms	High	Medium
	Loss of visual/community amenity	High	Low

Domain/s	Risk Issue	Risk Rating	
		Inherent	Residual
All domains	Revegetation targets for disturbed areas to be rehabilitated are not achieved	High	Medium

9. Closure implementation

9.1 Closure implementation strategies and tasks

FIJV intends to implement its closure strategies throughout all phases of the Project's life. Progressive rehabilitation will be a key aspect of the ongoing closure implementation. During each phase of the Project, steps will be taken so that closure objectives for the Project overall and each domain are achieved. Broad closure implementation strategies and tasks associated with each phase of the Project's life are presented below.

Project-wide closure implementation tasks have been divided into "short-term", "medium-term" and "long-term" based on the phase of mining that they are expected to occur within. The timeline for the occurrence of these tasks can be better refined as the Project progresses. Additionally, it is important to note that the list of Project-wide closure implementation tasks may be amended if completion criteria are changed in future MCPs.

9.1.1 Short-term

Planning and Design/Environmental Assessment

This phase is currently underway. It includes the preparation of this MCP as part of the ongoing PER assessment process. This phase involves the planning and design of the mine site layout, as well as initial planning for the closure of the mine based on baseline environmental investigations. During this phase, a post-mining land use and closure objectives are proposed with the expectation that they will be further refined as the Project progress and stakeholder consultation continues. A summary of the short-term closure implementation tasks for the Project are presented in Table 9-1.

Table 9-1 Short-term closure implementation tasks

Short-term tasks (prior to Q1 2021)
Activity
Continue baseline environmental investigations to inform the design/planning of the mine, rehabilitation and closure and close out current data gaps.
Continue desktop research into regional closure experience and relevant reference sites.
Undertake a materials balance to assess the availability and volumes of key materials for closure (including competent waste rock, subsoil, topsoil and low-permeability clays).
Finalise mine site layout, including the location, size and disturbance areas of infrastructure and landforms and identify dimensions of those features at mine end-of-life.
Conceptualise the final landform designs using layout and cross-sectional maps.
Commence stakeholder consultation through implementation of the SES, which includes discussion of the post-mining land use.
Conduct a closure risk assessment workshop with targeted stakeholders.
Develop completion criteria reflecting information from the above activities.
Ensure site construction and operational environmental management plans incorporate requirements for closure (e.g. material stockpiling, topsoil management).
Establish data management systems for mine closure information (spatial datasets, databases).

Short-term tasks (prior to Q1 2021)
Activity
First revision of the MCP (typically updated every three years, but the first revision will be updated prior to the construction of the mine).
Develop a decommissioning plan, which addresses the decommissioning phase and pre-mature closure.

9.1.2 Medium-term

Construction and Operations

During the construction and operations phases the stakeholder engagement process will continue and the details of the proposed post-mining land use option and landform designs will be further refined and agreed upon. Completion criteria will be updated and refined. Rehabilitation plans for the revegetation of each domain, as well as the monitoring plans for each domain will be further refined and completed. Progressive rehabilitation of disturbed areas will commence.

A summary of the medium-term closure implementation tasks for the Project are presented in Table 9-2.

Table 9-2 Medium-term closure implementation tasks

Medium-term tasks (Q1 2021 – Q1 2031)	
Activity	Phase
Execution of construction environmental management plans. Construction practices will be planned and performed with the closure phase in mind, e.g. top soil is removed and stored appropriately for use at closure.	Construction
Rehabilitation of areas disturbed by exploration activities.	Construction, Operations
Environmental monitoring continues and data is integrated into closure design.	Construction, Operations
Preliminary design of closure landform designs.	Construction, Operations
MCP updated every 3 years, including revision of closure risk assessment.	Construction, Operations
Finalise the agreement with stakeholders about the post-mining land use and the retention of any features.	Operations
Conduct rehabilitation/revegetation trials in each domain of the mine site.	Operations
Draft the closure monitoring plan (water, vegetation, landforms & site safety, weeds and feral animals).	Operations

9.1.3 Long-term

Decommissioning and closure

During the decommissioning phase, earthworks and rehabilitation activities will be occurring in accordance with rehabilitation and decommissioning plans for the site. All infrastructure will be removed from site unless previously agreed to be retained by the stakeholders. Monitoring

against completion criteria will commence. At least two years prior to the end of the mine's life, FIJV will amend the MCP to contain more specific detail around the planning and implementation of the decommissioning phase.

Post-closure

During post-closure, monitoring and maintenance activities will be undertaken as described in Section 10.

A summary of the long-term closure implementation tasks for the Project are presented in Table 9-3.

Table 9-3 Long-term closure implementation tasks

Long-term tasks (Q1 2031 – 2041+)	
Activity	Phase
Revisit the completed closure risk assessment and amend if required. Continue to update MCP every 3 years.	Decommissioning and closure
Continue collection and analysis of closure data.	Decommissioning and closure
Completion criteria are quantifiable and reviewed against ongoing monitoring data.	Decommissioning and closure
Complete detailed design and specifications of final landform designs.	Decommissioning and closure
Contaminated sites assessment and remediation in accordance with NEPM 2013 and DER 2014 guidelines, where applicable.	Decommissioning and closure
Perform rehabilitation earthworks (e.g. batter, shape, cap) and revegetation of landforms, if not done so already through progressive rehabilitation.	Decommissioning and closure
Continue with post-closure monitoring program (water quality, revegetation success, etc.)	Decommissioning and closure, post-closure
Conduct validation assessments for site relinquishment.	Decommissioning and closure, post-closure
Site relinquishment (once all conditions are met).	Post-closure

9.1.4 Premature closure: permanent closure or suspended operations under care and maintenance

If areas of the mine site are placed under care and maintenance in the future, infrastructure would remain intact and the site would continue to be managed, maintained and monitored. Monitoring during a potential care and maintenance phase is discussed in Section 10.

Planning for premature closure will be addressed in a Decommissioning Plan, scheduled to be written prior to construction works commencing. Financial provisioning for premature closure is discussed in Section 11.

9.2 Closure work program by domain

A closure work program for each domain is presented in the tables below, which contains closure activities and performance indicators for the structures present in each domain. It is important to note that the closure work program may be amended if completion criteria are changed in future MCPs.

9.2.1 Mine Pit

Table 9-4 Mine Pit closure implementation

Tenement No. M59/740			
Description & purpose: One open cut mine pit is proposed to be dug in the centre of the tenement.			
Closure Strategy: Pit will be backfilled to a level of at least 1 m above the expected final stablised groundwater level or a pit lake will be present. At ground level, the pit surrounds will be geotechnically stable and vegetated, with isolation fencing/bunding.		**Final landform design/land use**: Partially backfilled pit or pit lake	
Subdomain/structures	**Description**	**Closure work program**	**Performance indicator**
Mine Pit	Open cut mine pit	- Close out environmental data gaps pertaining to pit hydrogeology, hydrology, material characterisation and baseline information (Section 7.4). - Conduct desktop review of successful regional pit closure approaches. - Review mine plan with consideration of geotechnical stability of pit at the end of mine life. - Conceptualise pit water balance considering inflows and outflows. - Conceptualise and document the pit closure strategy with layout and cross-sections. - Identify data gaps in conceptual design and determine next steps (modelling etc).	- Conceptual pit closure design included within next revision of MCP. - Program of works identified within next revision of MCP.
Diversion Drains	Drainage system surrounding the mine pit to divert surface water flows.	- Close out environmental data gaps pertaining to site hydrology and baseline information (Section 7.4).	- Conceptual pit closure design included within next revision of MCP.

9.2.2 Mining Overburden and Waste Facilities

Table 9-5 Mining Overburden and Waste Facilities closure implementation

Tenement No. M59/740			
Description & purpose: An overburden storage facility and waste rock storage facility will be established adjacent to the mine pit during operations.			
Closure Strategy: Batter, shape, cap and revegetate landforms.		**Final landform design/land use**: Pastoral lease	
Subdomain/structures	**Description**	**Closure work program**	**Performance indicator**
Overburden facility	- Landform composed of stockpiled overburden. - The design of the landform will be based on the physical and geochemical properties of the contained materials.	- Review mine plan with consideration of landform dimensions at end of mine life. - Review the site materials characterisation and materials balance. - Conduct desktop review of successful regional landform closure approaches. - Review of baseline environmental data with consideration of the ecological function of landforms. - Review of site hydrology considering landform runoff and the diversion of surface water flows. - Conduct stakeholder consultation on visual amenity. - Determine conceptual landform design at closure, based on closure objectives. - Identify data gaps in conceptual design and determine next steps.	- Conceptual overburden landform closure design included within next revision of MCP. - Program of works identified within next revision of MCP.
Waste rock facility	- Landform composed of stockpiled waste rock. - The design of the landform will be based on the physical and geochemical properties of the contained materials.	As above.	- Conceptual waste rock landform closure design included within next revision of MCP. - Program of works identified within next revision of MCP.

9.2.3 Processing Waste Contaminant Facility

Table 9-6 Processing Waste Contaminant Facility closure implementation

Tenement No. L59/156			
Description & purpose: A dry processing waste facility will be established on the tenement.			
Closure Strategy: Batter, shape, cap and revegetate landform.		**Final landform design/land use**: Pastoral lease	
Subdomain/structures	**Description**	**Closure work program**	**Performance indicator**
Dry processing waste facility	- Landform composed of dry processing waste. - The design of the landform will consider the geochemical and physical characterisation of the waste material.	- Review mine plan with consideration of landform dimensions at end of mine life. - Review the site materials characterisation and materials balance. - Conduct desktop review of mines with similar processing methods and successful closure approaches. - Review of baseline environmental data with consideration of the environmental risk. Update risk register as required. - Review of site hydrology considering landform runoff and the diversion of surface water flows. - Conduct stakeholder consultation on visual amenity. - Determine conceptual landform design at closure, based on closure objectives. - Identify data gaps in conceptual design and determine next steps.	- Conceptual dry processing waste facility closure design included within next revision of MCP. - Program of works identified within next revision of MCP. - Risk register updated within next revision of MCP.

9.2.4 Mine and Processing Support Infrastructure

Table 9-7 Mine and Processing Support Infrastructure closure implementation

All tenements			
Description & purpose: Infrastructure will be located on all tenements and in the pipeline corridor to support all aspects of the mining operations.			
Closure Strategy: All infrastructure removed from site. All cleared/disturbed areas to be ripped and revegetated.		**Final landform design/land use**: Pastoral lease	
Subdomain & structures	**Description**	**Closure work program**	**Performance indicator**
Cleared areas/buildings	Unsealed site roads, laydown areas, parking areas, administration/accommodation buildings and workshops, guard house, explosives warehouse	- Develop inventory and/or layout maps of elements included within this domain from mine plan. - Develop conceptual closure plan for all elements, notwithstanding that some elements in future may be selectively retained. - Identify data gaps in conceptual design and determine next steps.	- Layout maps of each domain to be included in next revision of MCP. - Conceptual closure design included within next revision of MCP. - Program of works identified within next revision of MCP.
Water infrastructure	Fresh/recycled/drainage water ponds, water supply and monitoring bores	- As above; and - Continue baseline environmental monitoring of water resources (surface water, groundwater).	- As above; and - Baseline water characterisation data has been obtained and included in next revision of MCP.
Operational infrastructure	Stockpiles, conveyors, crusher, processing plant, power station, slurry/water/gas pipeline	- As per “cleared areas/buildings” above; and - Update the legal obligations register with any closure conditions from land access negotiations.	- As per “cleared areas/buildings” above, and - Updated legal obligations register included in next revision of MCP.

10. Closure monitoring and maintenance

10.1 Closure monitoring

The collection of information for closure commences with baseline environmental data collection. Baseline data collection involves field inspections and surveys, sampling, laboratory analysis and analysis/interpretation, which are all conducted by technical specialists. The approach applies standard methods, procedures and quality control systems. Baseline sampling locations consider both the onsite and offsite environment, to provide a broad depiction of the environment potentially impacted by the Project. The baseline sampling program is linked to the environmental approvals process.

During the construction and operations phases of the Project, FIJV plans to execute management and monitoring programs for managing environmental impacts. It is the patterns and trends established from regular monitoring which build a picture for sustainable closure. Operational monitoring programs will be supplemented by monitoring programs that target the pathway to closure. For example, rehabilitation monitoring will be occurring during these phases, since progressive rehabilitation will be an ongoing feature of the closure program throughout the life of the Project.

Closure monitoring will assess the condition of rehabilitated features and disturbed areas against closure completion criteria (Section 6) to demonstrate that closure objectives (Section 5.2) have been achieved. The monitoring programs aim to meet all obligations both to achieve closure status and meet legal obligations. The methodology and quality control of the monitoring programs will be undertaken in accordance with the relevant state and national guidelines and standards. The monitoring programs will be reported in Annual Environmental Reports (**AER**) (or as otherwise legally required) until the closure criteria is accepted.

Ongoing monitoring and maintenance requirements will be reassessed depending on the outcome of monitoring results and in consultation of major stakeholders and regulatory bodies. The monitoring period may be shortened or lengthened accordingly based on future closure performance but is currently estimated as 10 years following the cessation of mining. Relinquishment of tenements will be sought upon satisfying closure objectives and closure criteria for the domains upon audit and review approval. If monitoring data do not meet target values/ranges and thus indicates that key environmental indictors have moved outside the agreed upon closure criteria, additional monitoring and potential mitigating methodologies may be implemented in order to meet closure criteria standards.

Based on the baseline environmental data and the closure domains, some key monitoring activities for the Project are described below. It is expected that these monitoring activities will occur at least annually, however will occur at the frequency prescribed in future revisions of the mine closure plan.

10.1.1 Groundwater monitoring

Monitoring will be undertaken to assess the level and quality of groundwater. Monitoring data will be obtained from onsite and offsite bores to quantify changes in the groundwater environment. Visual inspections of all monitoring locations and equipment shall be completed and documented. The groundwater monitoring results will be assessed and reported in accordance with legal obligations and commitments.

10.1.2 Surface water monitoring

Monitoring will be undertaken to assess the quality and flow volumes of the surface water within the site and offsite, including the WPW, EPW, storage ponds and any surface water within the pit. Following the design of the site drainage network, sampling points will also be selected in targeted representative locations. Baseline surface water monitoring results will form the foundation for comparing all other monitoring and results will be assessed and reported in accordance with legal obligations and commitments.

10.1.3 Vegetation monitoring

FIJV intends to develop rehabilitation programs for each domain in order to revegetate areas within the MDE to their post-mining land use. Baseline vegetation monitoring will guide closure activities, such as the need for seed collection. Monitoring of rehabilitation progress is required to compare performance to closure criteria.

Weed monitoring will occur and it would be expected that this monitoring would be completed concurrently with the native vegetation monitoring. The vegetation and weed monitoring results and the implications for closure will be assessed and reported in accordance with legal obligations and commitments.

10.1.4 Fauna monitoring

Native fauna monitoring assesses the presence of species of national and state significance in the Project site and immediate surrounds. Both terrestrial and subterranean fauna monitoring will be used to prevent impact (through relocation or redesign of the mine facility, where required), monitor potential changes to the fauna and ensure the post-closure site is conducive with fauna requirements. Feral animal species will also be monitored to quantify the impact they may have on sustainable closure. Fauna field surveys will occur to quantify the presence of fauna species and those surveys will be undertaken in accordance with standard methods and reporting procedures.

10.1.5 Landforms and site safety

Landforms (pit, overburden, waste rock, dry waste) are to be inspected for geotechnical stability and erosional stability. The landforms will be inspected to confirm the integrity of bunds, fencing and indicators of unauthorised entry. The mine site will also be inspected to confirm that land features outside of restricted areas do not present an unacceptable safety risk to persons, stock animals or native fauna, such as the presence of eroded gullies or exposed hazardous materials.

Inspections are to include, but are not limited to:

- visual inspection;
- wall and/or slope stability;
- bund integrity;
- capping integrity;
- seepage checks;
- road condition; and
- erosion impacts.

10.2 Care and maintenance strategy

If areas of the mine site are placed under care and maintenance in the future, the site would continue to be managed, maintained and monitored.

Activities to be completed during the care and maintenance phase of the mine are expected to include but are not limited to:

- Drainage system maintenance
- Erosion control activities
- Road maintenance activities
- Monitoring equipment maintenance (water quality, air quality)
- Vegetation rehabilitation
- Pest control (invasive weed species and feral animals)

Further details around monitoring and maintenance activities during a care and maintenance phase will be addressed in the Decommissioning Plan, scheduled to be completed prior to the construction phase of the Project (as discussed in Section 9.1).

11. Financial provisioning for closure

FIJV understands that financial provisioning for closure is essential to ensure that adequate funds are available at the time of closure, so that the Western Australian State is not left with an unacceptable liability. FIJV also understands that it is important that the cost of closure is estimated as early as possible.

11.1 Costing methodology

The costing methodology will be based on the proposed area of disturbance for the Project. The costing will take into account the estimated volumes of material requiring earthworks, closure materials required (e.g. plants for revegetation, fencing, drainage control, etc.), hours of equipment usage and man hours required to complete closure activities. Initially, the costing methodology will be simple and high level and it will become progressively more detailed as the mine approaches operation and then closure.

11.2 Review of financial provision

The first financial provision estimate for closure will be based on the conceptual closure designs presented in the next revision of this MCP.

Following that, FIJV expects to review financial provisioning for closure every six years or when there are significant changes to the MCP, completion criteria or the mine site which would require closure costing methodology to be updated.

12. Management of information and data

FIJV currently maintain electronic records, information and data relevant to the Project on internal company networks. FIJV is committed to developing an electronic information management system for the Project, which contains mine site records and all environmental/safety information and data relevant to mine site closure. More detail regarding the information management system to be adopted and developed by FIJV will be available in subsequent revisions of this MCP.

13. Confidentiality

This mine closure plan is required to be publically accessible and available in accordance with the DMP Guideline for Preparing Mine Closure Plans, May 2015. This document is not considered to be confidential.

14. References

Beecham, B 2001, Avon Wheatbelt 1 (AW1 - Ancient Drainage subregion). In *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002* (pp. 7-35). Perth: Department of Environment and Conservation. Available from: https://www.dpaw.wa.gov.au/about-us/science-and-research/ecoinformatics-research/117-a-biodiversity-audit-of-wa.

BHP 2018, Mt Keith Satellite Mine Closure Plan, July 2018.

Bureau of Meteorology (BoM), n.d. *Climatology of Tropical Cyclones in Western Australia.* Australian Government. Retrieved 23 March 2019 from: http://www.bom.gov.au/cyclone/climatology/wa.shtml.

Brad Goode & Associates 2019a, Due Diligence Risk Assessment Advice for a Mine Proposal at Yalgoo and an Infrastructure Corridor Between Yalgoo and Geraldton Western Australia, A report prepared for FI Joint Venture Pty Ltd, April 2019.

Brad Goode & Associates 2019b, Report of an Aboriginal Heritage Survey for the Yogi Magnetite Project in the Shire of Yalgoo, Western Australia, A report prepared for FI Joint Venture Pty Ltd, May 2019.

Crosslands Resources Pty Ltd, Jack Hills Iron Ore Mine (Stage 1 Operations), Mine Closure Plan, April 2017.

Department of Environment and Conservation (DEC) 2011, Nomination of a Western Australian ecological community for listing as threatened, priority, change of status or delisting, Eucalypt woodlands of the Western Australian Wheatbelt. Unpublished report.

Department of Environment and Conservation (DEC) 2012, *Adapting to our changing climate*, Western Australian Government, October 2012. Retrieved 12 February 2019 from: https://www.der.wa.gov.au/images/documents/your-environment/climate-change/adapting-to-our-changing-climate-october-2012.pdf.

Department of Environment Regulation (DER) 2014, Assessment and management of contaminated Sites, Contaminated Sites Guidelines, Western Australia Department of Environment Regulation, December 2014.

Department of the Environment and Energy (DoEE) n.d., *Australia's bioregions (IBRA)*, retrieved 13 February 2019, from http://www.environment.gov.au/land/nrs/science/ibra.

Department of Industry, Tourism and Resources (DITR) 2007, Managing Acid and Metalliferous Drainage, Leading Practice Sustainable Development Program for the Mining Industry produced by the Department of Industry, Tourism and Resources, Canberra.

Department of Mines and Petroleum (DMP and Environmental Protection Authority (EPA), *Guidelines for Preparing Mine Closure Plans*, Western Australia, May 2015.

Department of Primary Industries and Regional Development (DoPIRD) 2018, Rangelands of Western Australia, Government of Western Australia. Retrieved 13 February 2019 from: https://www.agric.wa.gov.au/rangelands/rangelands-western-australia.

Department of Water and Environmental Regulation (DWER), Contaminated Sites Database, Government of Western Australia. Retrieved 21 February 2019 from: https://dow.maps.arcgis.com/apps/webappviewer/index.html?id=c2ecb74291ae4da2ac32c441819c6d47.

Desmond, A. and Chant, A 2001a, Yalgoo (YAL). In *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002* (pp. 656-667). Perth: Department of Conservation and

Land Management. Available from: https://www.dpaw.wa.gov.au/about-us/science-and-research/ecoinformatics-research/117-a-biodiversity-audit-of-wa.

Desmond, A. and Chant, A 2001b, Geraldton Sandplains 2 (GS2 - Geraldton Hills subregion). In *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002* (pp. 265-292). Perth: Department of Environment and Conservation. Available from: https://www.dpaw.wa.gov.au/about-us/science-and-research/ecoinformatics-research/117-a-biodiversity-audit-of-wa.

Duguid, A., Barnetson, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2005). Wetlands in the arid Northern Territory. A report to the Australian Government Department of the Environment and Heritage on the inventory and significance of wetlands in the arid NT. NT Government Department of Natural Resources, Environment and the Arts. Alice Springs.CSIRO Land and Water. (2013, April 18).

EnviroWorks Consulting 2017, Yogi-Magnetite Project - EPA Referral Supporting Document, FI Joint Venture Pty Ltd (FIJV), F05-J03.

Environmental Protection Authority of Western Australia (EPA) 2018, Notice of Decision to Consent to Change to Proposal During Assessment (12 November 2018).

GHD 2018a, FI Joint Venture Pty Ltd., Yogi – Magnetite Project Environmental, Scoping Document, Rev 2.

GHD 2018b, Desktop hydrogeological study (Memo), Prepared for Shadi Sadegh, FI Joint Venture Pty Ltd, 18 September.

GHD 2019a, FI Joint Venture Pty Ltd, Yogi – Magnetite Project, Public Environmental Review Document.

GHD 2019b, FI Joint Venture Pty Ltd, Yogi – Magnetite Project, Hydrogeological Investigation.

GHD 2019c, FIJV, Yogi Magnetite Mine Project, Stakeholder Engagement Strategy, Rev B.

GHD 2019d, FI Joint Venture Pty Ltd, Yogi Magnetite Project Environment Approvals, Surface Water Assessment.

GHD 2019e, FI Joint Venture Pty Ltd, Yogi Magnetite Project, Flora and Vegetation Assessment.

GHD 2019f, FI Joint Venture Pty Ltd, Yogi Magnetite Project, Pipeline Corridor Flora and Fauna Assessment.

GHD 2019g, FI Joint Venture Pty Ltd, Yogi – Magnetite Project, Fauna Assessment.

GHD 2019h, FI Joint Venture Pty Ltd, Yogi – Magnetite Project, Materials Characterisation Assessment.

GHD 2019i, FI Joint Venture Pty Ltd, Yogi – Magnetite Project, Air Quality Assessment.

Hennig, P, Curry, P J, Blood, D A, and Leighton, K A. (1994), An inventory and condition survey of the Murchison River catchment, Western Australia. Department of Agriculture and Food, Western Australia, Perth. Technical Bulletin 84. Available from: https://researchlibrary.agric.wa.gov.au/tech_bull/4/.

Invertebrate Solutions 2019a, Survey for Short Range Endemic fauna for the Yogi Magnetite Project, Yalgoo, Western Australia, March 2019. Report Number 2018ISJ0701_D01_20190107. Prepared for: FIJV Ltd, on behalf of GHD Pty Ltd.

Invertebrate Solutions 2019b, Phase 1 Survey for Subterranean Fauna for the Yogi Magnetite Project, Yalgoo, Western Australia, March 2019. Report Number 2018ISJ0702_D02_20190308. Prepared for: FIJV Ltd, on behalf of GHD Pty Ltd.

Kusha Madan Consulting Eng. 2018. *Mineral Resource Estimate Update, Yogi Mine, West Australia (Based on new data from drillings in 2017 by FIJV)*. Unpublished report prepared for FIJV, Tehran, Iran

Markey, A, S. and Dillon, S, J. (2006) Flora and Vegetation of the Banded Ironstone Formations of the Yilgarn Craton: The Central Tallering Land System. Unpublished report (draft) prepared for the Department of Environment and Conservation, 1st August 2006.

Payne AL, Van Vreeswyk AME, Pringle HJR (1998) Land Systems. In, An Inventory and Condition Survey of the Sandstone – Yalgoo – Paynes Find Area, Western Australia. Technical Bulletin No. 90 (eds AL Payne, AME Van Vreeswyk, HJR Pringle, KA Leighton and P Hennig), pp. 187–344. Agriculture Western Australia, South Perth.

Sandstone Operations Pty Ltd, Sandstone Gold Project Mine Closure Plan, May 2017.

The Shire of Yalgoo, n.d. *The Shire of Yalgoo*. Retrieved 30 January 2019, from History: http://www.yalgoo.wa.gov.au/the-shire/history.aspx.

Tille, P 2006, Soil-landscapes of Western Australia's Rangelands and Arid Interior, Resource Management Technical Report 313, Perth, Department of Agriculture and Food. Available from: https://researchlibrary.agric.wa.gov.au/rmtr/295/.

Appendix A – Site hydrology photographs

Western Primary Watercourse (WPW) (GHD 2019d)


Minor channels (left) and evidence of sheetflow (right) debris in WPW upstream of mine pit.


The well-defined WPW channel immediately south and downstream of proposed mine pit with evidence of granitic outcrops on the channel bed, livestock activity (left) and bank erosion (right).


WPW further downstream of mine site exhibiting a still very well defined channel, albeit wider and shallower.

Eastern Primary Watercourse (WPW) (GHd 2019d)

EPW upstream of mine site, directly west of inselberg, with rocky and vegetated banks (left), and evidence of debris piled high against bank vegetation (right) from significant flow events.

EPW at point east of proposed Guard House, showing abundant vegetation within channel bed and banks (left), and evidence of bank erosion (right)

Appendix B – Vegetation assessment information

Vegetation types within MDE survey area (GHD 2019g)

Vegetation type	Description	Extent (ha)	Landform, sample locations and notes	Representative photograph
BIF				
ArrTdHc (1c)	*Acacia ramulosa var. ramulosa, A. umbraculiformis* tall sparse shrubland over *Thryptomene decussata, Philotheca brucei* subsp. *brucei, Aluta aspera* subsp. *hesperia* mid sparse to open shrubland over *Helipterum craspedioides, Erodium cygnorum, Wurmbea densiflora* isolated herbs. Indicator species: *Acacia ramulosa* var. *ramulosa*, *Thryptomene decussata, Philotheca brucei* subsp. *brucei, Aluta aspera* subsp. *hesperia*.	65.72	Landform: Upper slopes and crests of BIF Sample locations: Q04, Q15, Q16, Q34, Q38. Similar to VT12 described by Maia (2011). Aligns with Community 2 described by Markey and Dillon (2008).	
AtEgCd (1b)	*Acacia tetragonophylla, A. ramulosa* var. *ramulosa, A. pteraneura* mid to tall sparse shrubland over *Eremophila galeata, Ptilotus obovatus, Maireana carnosa, Solanum lasiophyllum* low sparse shrubland over *Cephalipterum drummondii, Roebuckiella ciliocarpa, Helipterum craspedioides* isolated herbs. Indicator species: *Acacia tetragonophylla, Eremophila galeata, Ptilotus obovatus, Maireana carnosa, Solanum lasiophyllum*.	833.66	Landform: lower and mid slopes, low crests and hills of BIF Sample locations: Q01, Q03, Q05, Q35, Q44. Mapped as TSAa, TSAqEf by Coffey (2010) Mapped as TSAtAa in the southern part of the survey area by ATA (2006, 2007) Similar to Community 3b and 4 described by Markey and Dillon (2008).	

Vegetation type	Description	Extent (ha)	Landform, sample locations and notes	Representative photograph
AEgRc (1a)	*Acacia* spp. mid to tall sparse shrubland over *Eremophila galeata, Ptilotus obovatus, Maireana carnosa* low sparse shrubland over, *Roebuckiella ciliocarpa, Lemooria burkittii, Helipterum craspedioides* sparse herbland. Indicator species: *Acacia* spp., *Eremophila galeata, Ptilotus obovatus, Maireana carnosa, Roebuckiella ciliocarpa*.	141.70	Landform: low slopes, colluvial flats around BIF ranges Sample locations: Q06, Q37, Q39 Similar to VT7 described by Maia (2011). Similar to Community 3b described by Markey and Dillon (2008).	
Floodplains				
APoEc (2)	*Acacia* spp. *(Acacia tetragonophylla, A. burkittii, A. ramulosa* var. *ramulosa, A. pteraneura, A. caesaneura), Hakea recurva* subsp. *recurva* mid to tall open shrubland over *Eremophila forrestii* subsp. *forrestii, Ptilotus obovatus, Solanum lasiophyllum, Sida* sp. dark green fruits (S. van leeuwen 2260), *Maireana planifolia* low sparse shrubland over *Erodium cygnorum, Chthonocephalus pseudevax, Helipterum craspedioides* sparse herbland. Indicator species: *Acacia tetragonophylla, A. burkittii, Eremophila forrestii* subsp. *forrestii, Ptilotus obovatus, Solanum lasiophyllum, Maireana planifolia, Erodium cygnorum.*	5,587.38	Landform: floodplains Sample locations: Q02, Q07, Q08, Q17, Q19, Q20, Q21, Q22, Q24, Q25, Q27, Q28, Q30, Q33, Q36, Q43, Q45, Q47, Q48, Q49, Q50, Q51, Q54, Q55. Mapped as TSAtAa in the southern part of the survey area by ATA (2006, 2007) Mapped as TSAcAgAtAb and TSAbAtAcAa by Coffey (2010).	
Mosaic between APoEc and AeFsEd (3)	APoEc and AeFsEd formed a mosaic in areas adjacent to one of the major drainage lines. This has been mapped as Mosaic between APoEc and AeFsEd (3).	93.48	Landform: floodplains and seasonal inundated areas Sample locations: Q42	

Vegetation type	Description	Extent (ha)	Landform, sample locations and notes	Representative photograph
Drainage areas				
AeFsEd (4)	*Acacia eremaea* mid to tall sparse shrubland over *Frankenia setosa, Maireana tomentosa, Ptilotus obovatus* low open shrubland over *Eragrostis dielsii, Helipterum craspedioides, Chthonocephalus pseudevax* isolated grasses and herbs. Indicator species: *Acacia eremaea, Frankenia setosa, Maireana tomentosa, Eragrostis dielsii.*	391.26	Landform: floodplains and seasonal inundated areas Sample locations: Q09, Q10, Q41, Q46	
AtSePd (5)	*Acacia tetragonophylla* mid to tall sparse shrubland over *Sida ectogama, Solanum lasiophyllum, Eremophila galeata* low sparse shrubs over *Cymbopogon ambiguus* mid isolated tussock grasses over *Pluchea dentex, Roebuckiella ciliocarpa, Helipterum craspedioides* isolated herbs. Indicator species: *Acacia tetragonophylla, Sida ectogama, Solanum lasiophyllum, Cymbopogon ambiguus, Pluchea dentex*.	99.77	Landform: minor drainage lines and gullies Sample locations: T01, T03, T04, T05 Mapped as TSTOSAtAnAs in the southern part of the survey area by ATA Environmental (2006)	
AbCaPd (6)	*Acacia burkittii, A. tetragonophylla* mid to tall open shrubland over *Ptilotus obovatus, Solanum lasiophyllum* low sparse shrubs *over Cymbopogon ambiguus* mid isolated tussock grasses over *Pluchea dentex, Lysimachia arvensis, Cyperus ?alterniflorus, Euphorbia drummondii* isolated herbs and sedges. Indicator species: *Acacia burkittii, A. tetragonophylla, Cymbopogon ambiguus, Pluchea dentex, Lysimachia arvensis, Cyperus ?alterniflorus, Euphorbia drummondii*.	157.48	Landform: major drainage lines Sample locations: Q12, Q29, Q40, Q53, T02 Mapped as TSAbAtAcAa in the western part of the survey area by Coffey (2010)	

Vegetation type	Description	Extent (ha)	Landform, sample locations and notes	Representative photograph
Granite outcrops				
AuEeBs (7)	*Acacia umbraculiformis, A. tetragonophylla, A. ramulosa* var. *linophylla* tall to mid-sparse shrubland over *Eremophila exilifolia, E. forrestii* subsp. *forrestii* mid- isolated shrubs over *Borya sphaerocephala, Ptilotus obovatus, Solanum lasiophyllum* low isolated shrubs over *Hyalosperma glutinosum* subsp. *venustum, Pogonolepis muelleriana* isolated herbs. Indicator species: *Acacia umbraculiformis, Eremophila exilifolia, E. forrestii* subsp. *forrestii, Borya sphaerocephala, Hyalosperma glutinosum* subsp. *venustum, Pogonolepis muelleriana*.	824.77	Landform: granite outcrops with shallow soils. Sample locations: Q13, Q14, Q18, Q23, Q26, Q31, Q32, Q52	
Low rises				
AiMsSa (8)	*Acacia incognita* mid isolated shrubs over *Micromyrtus sulphurea, Ptilotus obovatus, Eremophila latrobei* subsp. warty leaves (M. Officer 230) low isolated shrubs over *Stenopetalum anfractum, Gnephosis brevifolia, Goodenia ?pinnatifida* isolated herbs. Indicator species: *Acacia incognita, Micromyrtus sulphurea, Ptilotus obovatus, Stenopetalum anfractum, Gnephosis brevifolia*.	1.04	Landform: low lateritic rise Sample locations: Q11	No photo available
Cleared areas				
Cleared (0)	Cleared areas including the Yalgoo – Mt Magnet Road	33.57		

Appendix C - Fauna assessment information

Major fauna habitats within MDE survey area (GHD 2019g)

Description	Extent in the Survey area	Representative Images
BIF Ridgeline **Open shrublands of Acacia sp., Thryptomene sp., Eremophila forrestii, E. galeata and Ptilotus sp. On low banded ironstone formation ridgelines.** Along the western edge of the survey area is a Banded Ironstone low rocky ridge line and associated rocky slopes. This habitat supports limited vegetation (likely due to shallow soil profiles). However the environment supports scattered mixed shrubs of Acacia, Thryptomene sp., Eremophila forrestii, E. galeata and Ptilotus sp.. The environment had little ground covers, litter, logs or debris. This is possibly due to the lack of vegetative material and/or by grazing from Cattle. There was no evidence of fire in this environment. The low rocky slopes are a mosaic of quartz and iron stone composition with scattered minor outcropping, crevasses, slopes, rock sizes and stability. No typical caves were recorded in outcropping but ground level undermined areas were recorded around some small breakaways. These appeared to be utilised by Euro (*Macropus robustus*), Echidna (*Trachyglossus aculeatus*), Woolleys's Pseudantechinus (*Pseudantechinus woolleyae*) and/or large monitor lizards. Due to the lack of cover and shallow soils (difficulty for species to dig and hide) few specimens were trapped in this environment however Spinifex Hopping Mouse (*Notomys alexis*) appeared to be the most abundant. However this species appeared to be travelling from the plain to feed on the ridgeline. The Chestnut-breasted Quail-thrush (*Cinclosoma castaneothorax*) was the most common bird species recorded in this environment. **Conservation significant fauna** Few fauna species were recorded in this environment however two species are known to persist. The rocky slopes and ridgeline would provide core habitat for the Long-tailed Dunnart (*Sminthopsis longicaudata*) (ie denning) and Gilled Slender Bluetongue (*Cyclodomorphis branchialis*), which is known from the region and likely to occur in the survey area. The Western spiny-tailed skink (*Egernia stokesii badia*) was recorded in this environment via a latrine site and is likely to persist in other small outcropping areas present. Peregrine Falcon (*Falco peregrinus*) may also utilise these areas for foraging.	1249.57 ha	 

Description	Extent in the Survey area	Representative Images
Moderate value (But maybe of high value if additional Western Spiny-tailed Skinks are located)		
Riparian/Creek line **Tall shrublands Callistemon, Eucalyptus, Scaevola with herbs and grassland along minor creeks and drainagelines** An ephemeral creek/drainage lines runs from the north eastern corner of the survey area south west and along the base of the BIF ridge. The main drainage line follows the gradient of the survey area, generally flowing from east to west. The creek and other small ephemeral creeks supports generally narrow, linear shrublands and open woodlands and was more structurally diverse than the surrounding habitats. The vegetation along these drainage lines is dominated by *Acacia* species with scattered mixed shrubs including *Callistemon, Eucalyptus, Scaevola* with herbs and grassland. In areas this environment was densely vegetated particularly where associated to sandy soils, heavier soils had little vegetation. Areas had good litter and debris present including large branches and logs creating numerous usable habitat options for fauna species. The drainage lines have a mosaic of substrates with a complex and variable mix of rocky, stony and sandy profiles. The substrates would vary and erode in response to rainfall and flooding. There was no evidence of fire in this habitat. These linear patches of habitat provide a corridor for the movement of fauna through the local landscape. Small birds (such as the Splendid Fairy-wren (*Malurus splendens*) and honeyeaters) would utilise this denser vegetation for foraging, movement and nesting. Two species of frog the Central Burrowing frog (*Platyplectrum spenceri*) and Guenther's Toadlet (*Pseudophryne guentheri*) were also recorded in this habitat after a rain event. **Conservation significant fauna** The increased structural diversity and substrate variation in this environment is likely to support a broader suit of fauna species than the surrounding habitat types. Additionally these drainage lines would be utilised as corridors for species. The Gilled Slender Bluetongue may utilise the rocky habitat in portions of the drainage lines while the Peregrine Falcon would utilise these well vegetated corridors for hunting/foraging. **High Value**	421.03 ha	 

Description	Extent in the Survey area	Representative Images
Flood Plain **Mixed Shrublands of Acacia, Eremophila, Grevillia and Hakea on seasonally inundated floodplain** The floodplains surrounded the ephemeral main Creek line in the survey area. The vegetation consisted of mixed shrublands of *Acacia, Eremophila, Grevillia* and *Hakea*. This habitat was diverse in structure and was evidently sculptured by moving waters. Some areas were deep sands while others loam. There were high points in the environment and areas where water ran or pooled. There was no evidence of fire in this environment. This habitat would provide a variety of habitat resources for fauna species, and patches had a greater structural diversity than the surrounding shrublands. The *Acacia* shrublands that occur on the floodplains surrounding the Creek (and higher sandy areas) would also provide good habitat for burrowing species (such as Jan's Banded Snake (*Simoselaps bertholdi*)) given the looser sandy substrate. **Conservation significant fauna** The increased structural diversity and substrate variation in this environment is likely to support a broader suit of fauna species than the surrounding habitat types. The Peregrine Falcon would utilise these well vegetated corridors for hunting/foraging. **Moderate Value**	288.0 ha	
Chenopod Plain **Low open healthland of Atriplex, Marieana, Sclerolaena and scattered Acacia on fine sandy soils.** The Chenopod Plain compiled a relatively small area around the flood Plain and riparian/drainage line areas. The plain comprised fine sands over a layer of heavy loam with an over storey dominated by hardy, low shrub species. The dominant plant species were *Acacia, Atriplex, Marieana,* and *Sclerolaena* with herbs and grasses. The main areas of chenopods were located in the north west of the site and were in close proximity to surface water used as a drinking source for pastoral and native animals. As such bovine grazing (showing signs of heavy grazing, soil compaction and trampling) noticeably impacted the chenopod plains. The Chenopod Plains had high lizard activity (which is represented in trapping site 1 data) but does not attract large numbers of small mammals which is probably due to the lack of over storey coverage. **Conservation significant fauna** The increased structural diversity and sandy substrate in this environment is likely to support a broader suit of fauna species than the surrounding habitat types. Additionally the Chenopod fruits are a well known food item for native wildlife and	253.24 ha	

Description	Extent in the Survey area	Representative Images
thought to be the main reason they are utilise by Night Parrot. The Gilled Slender Bluetongue may utilise this habitat and the Peregrine Falcon would utilise these well vegetated corridors for hunting/foraging. **High Value**		
Mixed Acacia Plain **Shrublands of Mixed Acacia on plain on loam/clay soils** Acacia shrublands are the most dominant habitat type within the survey area, comprising a variety of different vegetation types including open *Acacia* shrublands with grasses and herbs and denser areas of tall *Acacia* shrubland with little understorey. A large proportion of the *Acacia* shrublands has been previously disturbed by cattle grazing, resulting in large areas with very limited understorey or groundcover vegetation. There are also areas with little evidence of disturbance, which retain some structural diversity. The environment had areas of good ground covers, litter, logs or debris. There was no evidence of fire in this habitat. In areas where the shrubland is denser, this vegetation would provide suitable habitat for a variety of fauna species, in particular foraging opportunities, breeding habitat and refugia for bush birds and small mammals. Where the shrubland was more open, and on loamy soils, large termitaria were present. Termitaria provide habitat and food source for numerous small reptiles, mammals and invertebrates. **Conservation significant fauna** This habitat is the most homogenic and widespread in the region. Historically numerous species would have persisted but are now locally extinct. The Gilled Slender Bluetongue may utilise this habitat and the Peregrine Falcon would utilise these well vegetated corridors for hunting/foraging. **Moderate Value**	4991.22 ha	 

Description	Extent in the Survey area	Representative Images
Granitic formations **Scattered Low Shrublands of Acacia, Eremophila, Grevillia, Hakea and Boyra amongst granite outcropping** Granite outcrops occur over the site and throughout the immediate surrounding area. A greater number of outcrops are present in the north eastern portion of the survey area and situate in raised undulations over the survey area. The granite formations are usually associated with low vegetation types due to the shallow soils and comprise *Acacia, Eremophila, Grevillia, hakea,* and *Boyra* and an abundance of grasses and herbs. The environment had areas of good ground covers, litter and debris but lacked logs due to vegetation present. However the outcropping with exfoliating rock, crevices and slabbing provides excellent cover for a range of fauna species. There was no evidence of fire in this habitat. False Antechinus appears to be the most common mammal to frequent or reside near this habitat type. Cracks and ledges formed in the granite and its loose stones provide a majority of the habitat for reptiles and small mammals to hide. **Conservation significant fauna** The Western spiny-tailed skink was detected in cracks and ledges of granitic formations in the survey area and immediate surrounds. Several colonies of Western Spiny-tailed Skink were found under granite ledges to the north-east of the study area during an active search and a number of latrines were located within the survey area suggesting the species is present in other granite habitat nearby. Additionally the Long-tailed Dunnart and Gilled Slender Bluetongue is also likely to utilise this habitat. Peregrine Falcon may also utilise these areas for foraging. **High Value**	1027.03 ha	 

Appendix D - Closure risk assessment register

- Closure risk assessment register
- Closure risk assessment framework

Yogi Magnetite Project – Closure Risk Assessment Register											
Domain/s	Risk Issue	Causes	Potential Impacts to Environmental Factors	Likelihood	Consequence	Risk	Controls	Likelihood	Consequence	Risk	Person/s Responsible
Mine Pit	Contamination of surface water, groundwater and/or soil onsite and/or offsite by pit lake water, if a pit lake is present onsite post-closure.	- Pit lake water quality is poor due to the geochemistry of the pit wall. - Poor quality water is transferred from the pit into the surrounding environment through hydrological and/or hydrogeological fluxes. - Native fauna and stock animals are exposed to the pit lake water (by way of the lake itself or other water sources).	- Decline in quality of groundwater and surface water sources. - Toxic effects to native fauna and stock animals through being exposed to contaminated vegetation, soil and water. - Toxic effects to vegetation and land use from contaminated soil and water.	Likely	Major	High	- Geochemical characterisation of pit material to understand potential risks to water quality. - Water quality monitoring against target value ranges during mining and post-closure. - Engineering controls to divert flows away from sensitive environmental receptors. - Treat pit lake water if target water quality values are not met.	Unlikely	Moderate	Medium	Environmental Manager / Mine Engineering Manager
	Pit wall instability – slope failure/erosion.	- Poor design and/or construction of pit. - Failed drainage controls. - Slope failure and erosion.	- Remedial earthworks required with potentially substantial costs. - Delays in achieving mine closure objectives required for tenement relinquishment.	Possible	Moderate	Medium	- Engineering design of pit with consideration of closure. - Earthworks undertaken to reshape pit walls to a stable slope angle and provide support. - Geotechnical inspections of the pit wall throughout the mine's life and post-closure.	Rare	Minor	Low	Mine Engineering Manager
	Injury or death to people or fauna.	- Pit does not have appropriate fencing/barricade and signage to prevent unauthorised entry.	- Injury or death to people. - Injury or death to fauna (native or stock animals).	Unlikely	Moderate	Medium	- Pit perimeter will be bunded, fenced and signed to prevent unauthorised entry. - Inspections of safety aspects of the pit throughout mine's life and post-closure.	Rare	Minor	Low	Mine Safety Manager / Mine Manager
	Loss of visual or community amenity.	- Construction of the pit within the surrounding landscape.	- Decreased visual amenity. - Loss or negative effects to vegetation, water sources and land use.	Possible	Minor	Medium	- Stakeholder engagement outcomes to inform rehabilitation plan for pit surroundings.	Possible	Insignificant	Low	Stakeholder Engagement Manager / Environmental Manager / Mine Manager
Mining Overburden and Waste Facilities	Landform instability – slope failure/erosion.	- Slope failure of landform. - Erosion from water or wind. - Poor design/engineering/construction of landform. - Failed drainage controls. - Extreme rainfall event. - Weathering of rock material.	- Releases from the landform which negatively affect surrounding environmental receptors (vegetation/surface water quality/air quality). - Remedial earthworks required with potentially substantial costs. - Delays in achieving mine closure objectives required for tenement relinquishment.	Likely	Moderate	High	- Engineering design of facilities with consideration of closure. - Geotechnical inspections of the landforms throughout the mine's life and post-closure. - Earthworks and progressive rehabilitation of landforms undertaken to prevent erosion and production of dust. - Earthworks undertaken to make stable slope angle. - Drainage controls implemented.	Possible	Moderate	Medium	Mine Engineering Manager
Processing Waste Contaminant Facility	Leaching from hazardous materials within landforms.	- Infiltration of rainfall. - Weathering of rock material.	- Contamination of surface water sources. - Contamination of groundwater. - Toxic effects to vegetation and land use from contaminated soil and water. - Toxic effects to native fauna and stock animals through being exposed to contaminated vegetation, soil and water.	Likely	Major	High	- Waste characterisation to understand geochemistry and acid generating/acid mine drainage potential of materials within landform. - Cover and capping works/rehabilitation to reduce water infiltration. - Drainage controls implemented. - Groundwater and surface water monitoring in the surrounds and offsite from the landforms to occur during mining and post-closure to determine any negative effects to environmental receptors.	Unlikely	Moderate	Medium	Mine Engineering Manager / Mine Environmental Manager

Yogi Magnetite Project – Closure Risk Assessment Register											
Domain/s	Risk Issue	Causes	Potential Impacts to Environmental Factors	Likelihood	Consequence	Risk	Controls	Likelihood	Consequence	Risk	Person/s Responsible
	Loss of visual or community amenity.	- Increased visibility of landforms within the surrounding landscape. - Production of dust from erosion of landforms.	- Decreased visual or community amenity. - Loss or negative effects to vegetation and land use and decreased air quality.	Almost certain	Minor	High	- Stakeholder engagement to inform closure plan for landforms. - Progressive revegetation of landform undertaken to complement surrounding environment. - Air quality and/or visual amenity modelling of the closure scenario.	Unlikely	Minor	Low	Stakeholder Engagement Manager / Environmental Manager / Mine Manager
Mine and Processing Support Infrastructure	Safety incidents to people or fauna (native/stock) that access the site post-closure.	- Lack of or poor fencing/barricade and signage to prevent entry or to advise of exclusion areas. - Hazardous materials left onsite post-closure. - Infrastructure or other mine service features (e.g. water storage ponds) left onsite post-closure.	- Injury or death to people or fauna that access the site post-closure.	Unlikely	Moderate	Medium	- All above ground and below ground infrastructure will be removed and disturbed area rehabilitated. - All site surface water bodies will be removed and disturbed area rehabilitated, unless otherwise agreed with stakeholders. - All hazardous materials will be removed from site or disposed of/buried in designated areas. - Fencing/barricades and signage will be present around site. - Former access roads to site will be rehabilitated to prevent continued use. - Inspections of site safety throughout mine's life and post-closure.	Rare	Minor	Low	Mine Safety Manager / Mine Manager
	Contamination of surface water, groundwater and soil onsite and/or offsite.	- Erosion/exposure of any buried hazardous materials disposed of onsite. - Hazardous materials left uncovered onsite. - Contaminated surface water runoff migrates offsite. - Leaching from hazardous materials to groundwater.	- Decline in quality of groundwater and surface water sources. -Toxic effects to native fauna and stock animals through being exposed to contaminated vegetation, soil and water. - Toxic effects to vegetation and land use from contaminated soil and water.	Possible	Minor	Medium	- Any contaminated soil onsite removed or remediated. - Hazardous materials disposed of onsite are capped and covered appropriately to prevent erosion and water infiltration. - Groundwater and surface water monitoring to occur onsite and offsite during mining and post-closure to determine any negative effects to environmental receptors.	Unlikely	Minor	Low	Mine Environmental Manager / Mine Engineering Manager
	Pipeline has variable closure conditions which makes relinquishment difficult to achieve.	- Pipeline route is on several different land parcels and individual agreements may need to be sought with each regarding relinquishment conditions.	- Inconsistent closure requirements, leading to additional cost or inconsistent environmental outcomes.	Possible	Minor	Medium	- Consider closure requirements during land access negotiations.	Unlikely	Minor	Low	Mine Environmental Manager / Stakeholder Engagement Manager
All domains	Revegetation targets for disturbed areas to be rehabilitated are not achieved.	- Vegetation does not establish due to natural causes, e.g. lack of rainfall. -Vegetation does not establish due to poor management practices, e.g. management of topsoil. - Poor seed quality and/or unsuitable growth medium. - Unsuitable species chosen for revegetation.	- Post-mining land use is not achieved. - Target richness/density of vegetation is not achieved. - Delays in achieving the mine closure objectives required for tenement relinquishment.	Likely	Moderate	High	- Set realistic and achievable post-mining land use and rehabilitation completion criteria. - Undertake revegetation trials throughout the life of the mine to gain information on local conditions to improve the likelihood of revegetation success. - Apply a suitable growth media (e.g. topsoil from site) that has been managed properly. -Perform ripping and sowing with suitable native species seeds and fertiliser.	Possible	Minor	Medium	Mine Environmental Manager

Risk Matrix					
Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	HIGH	HIGH	EXTREME	EXTREME	EXTREME
Likely	MEDIUM	HIGH	HIGH	HIGH	EXTREME
Possible	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Unlikely	LOW	LOW	MEDIUM	HIGH	HIGH
Rare	LOW	LOW	MEDIUM	MEDIUM	HIGH

Likelihood Criteria			Description
Likelihood	Frequency	Probability	
Rare	Only occurs in exceptional circumstances – less than once in 50 years	<5% chance of occurring in 1 year	Highly unlikely to occur, only occurs in exceptional circumstances. Only known to have occurred 1-2 times at similar operations.
Unlikely	Could occur every 10-20 years	5-30% chance of occurring in 1 year	Unlikely to occur but there is a possibility it may occur. Has occurred before within the industry.
Possible	Occurs at least once every 5 years	30-60% chance of occurring in 1 year	Possible it may occur at some time as it has happened previously on an irregular basis within the industry.
Likely	Occurs every 1-2 years	60-80% chance of occurring in 1 year	Likely to occur as it is known to occur and has occurred on a number of occasions within the industry.
Almost Certain	Occurs more than once per year	80-100% chance of occurring in 1 year	Event is expected to occur in most circumstances as it is a common or repeating occurrence within the industry.

Consequence Criteria					
Environmental Factor	Insignificant	Minor	Moderate	Major	Catastrophic
Biodiversity/ Flora/ Fauna/ Ecosystem	Mortality or injury of a general (non-conservation significant) native fauna species individual	Mortality or injury of a small number of conservation significant or general native fauna species (typically <5) that does not have a lasting effect on the local population.	Mortality or injury of a small number of conservation significant or general native fauna species (typically <10) that has a medium term effect on the local population.	Mortality of up to 20 conservation significant fauna individuals (or multiple unlisted native fauna <50) Widespread, long term loss of a large number of general native fauna (>100).	Widespread mortality of conservation significant fauna having a long term impact potentially causing a change in or review of the species protection category. Widespread, long term loss of of a large number of unlisted native fauna (>100).
	Minor, short term isolated loss of conservation significant or general native fauna habitat within the Mine Development Envelope that is well represented in the area	Short term localised loss of conservation significant or unlisted native fauna habitat within the Mine Development Envelope that is well represented in the area	Medium term loss of habitat for conservation significant fauna of up to 20% at a local scale	Long term loss of habitat for a conservation significant fauna of 0-20% at a regional scale or 20-50% at a local scale	Permanent, widespread loss of habitat for conservation significant fauna of >20% at a regional scale or >50% at a local scale.

	Minor, temporary decline in vegetation diversity, abundance and health within an isolated area of the Mine Development Envelope that does not impact on conservation significant flora. Recoverable within <1 year	Minor decline in vegetation diversity, abundance and health within the Mine Development Envelope that can include impact on conservation significant flora. Recoverable in the short term <5 years	Moderate, localised decline in vegetation diversity, abundance and health that can include localised loss of a conservation significant flora species. Recoverable in the medium term <10 years.	Major regional decline in vegetation diversity, abundance and health that can include localised loss of a conservation significant flora species. Recoverable in the long term <50 years.	Significant, widespread and permanent decline in vegetation diversity, abundance and health that can include complete loss of conservation significant flora species within the region. Not recoverable.
	Minor, temporary, localised decline in biodiversity within the Mine Development Envelope (recoverable within 1 year)	Minor, short term, localised decline in biodiversity within the Mine Development Envelope (recoverable within 5 years)	Moderate, medium term, localised decline in biodiversity (recoverable within 10 years)	Widespread, long term, regional decline in biodiversity (recoverable within 50 years)	Significant, widespread and permanent decline in biodiversity within the region. Not recoverable
Air Quality	Short term minor reduction in local air quality that does not exceed National Environmental Protection Measure (NEPM) criteria or Part V operating licence limit.	Short term reduction in local air quality that exceeds NEPM criteria or Part V operating licence limit.	Reduction in regional air quality that exceeds NEPM criteria but can be rectified in the short term.	Reduction in regional air quality that results in exceedance of NEPM criteria and will require long term ongoing management. May impact on human health	Permanent, ongoing reduction in regional air quality that exceeds NEPM criteria, is unable to be rectified and impacts on human health
Landforms - land degradation	Land contamination within an isolated area in the Mine Development Envelope that requires limited remediation, if any. Does not impact on other environmental values.	Land contamination within the Mine Development Envelope that can be remediated in the short term. Does not impact on other environmental values.	Localised land contamination within the Mine Development Envelope that can be remediated in the medium term, may have secondary impacts to environmental values within the Mine Development Envelope	Land contamination which impacts the local area outside the Mine Development Envelope. Requires significant remediation effort over the long term and impacts on environmental values within the affected area	Land contamination which impacts a large area outside the Mine Development Envelope which is long lasting (> 50 years) and requires long term, ongoing management. The contamination impacts on environmental values which may not recover.
Landforms - soils	Minor loss of soils within an isolated area in the Mine Development Envelope that does not impact on environmental values	Moderate loss of soils that that causes localised short term impact on environmental values within the Mine Development Envelope	Moderate loss of soils that causes a medium term impact on environmental values within the region	Major loss of soils that has a moderate to long term impact on environmental values within the region	Significant loss of soils that has a permanent impact on environmental values within the region.
Surface Water	Minor localised (within the Mine Development Envelope) decline in surface water quality, availability and/or flows that does not affect beneficial use	Localised (within the Mine Development Envelope) decline in surface water quality, availability and/or flows that impacts beneficial use but will recover in the short term	Moderate decline in surface water quality, availability and/or flows downstream of the Mine Development Envelope that impacts beneficial use in the short term	Significant decline in surface water quality, availability and/or flows on a regional scale that restricts beneficial use in the short to medium term	Significant decline in surface water quality, availability and/or flows on a regional scale that restricts beneficial use in the long term and recovery is unlikely
Groundwater	Minor localised (within the Mine Development Envelope) decline in ground water quality, availability and/or change in water levels that does not affect beneficial use	Localised (within the Mine Development Envelope) decline in ground water quality, availability and/or change in water levels that impacts beneficial use but will recover in the short term	Moderate decline in groundwater quality, availability and/or water levels beyond the Mine Development Envelope that impacts beneficial use in the short term	Significant decline in groundwater quality, availability and/or water levels on a regional scale that restricts beneficial use in the short to medium term	Significant decline in groundwater quality, availability and/or water levels on a regional scale that restricts beneficial use in the long term and recovery is unlikely
Mine Closure	Post-mining landforms are safe, stable and predominantly free of erosion features	Post-mining landforms are generally safe and stable but have some minor erosion that doesn't warrant remedial work or require ongoing management	Post-mining landforms are predominantly safe and stable but have some moderate erosion features which can be fixed through remedial work	Post-mining landforms are unsafe and unstable and have significant erosion features across the landform that will require ongoing management or significant remedial work to rectify	Post-mining landforms are unsafe and unstable. They have either experienced complete failure or are eroded to an extent that reconstruction the whole or part of the landform is required.

	Revegetation is only slightly less than biodiversity targets for species richness, survival rates and density, intervention is unlikely to be required to achieve the targets	Revegetation is below biodiversity targets for species richness, survival rates and density but it is expected to be able to be address through minor intervention in the form or supplementary seeding, planting or weed management	Revegetation is moderately below biodiversity targets for species richness, survival rates and density. It is not expected to meet the targets without a period of intervention using a variety of techniques	Revegetation is significantly below (less than half) biodiversity targets for species richness, survival rates and density after a prolonged period of time (10 years)	Revegetation is not successful. Vegetation is unable to be successfully established
	Post-mining landforms are non-polluting, with potentially hazardous materials contained within the landform.	Post-mining landforms have a minor amount of potentially hazardous materials present which may cause short term pollution to the immediate environment but management is not required.	Post-mining landforms have a minor amount of potentially hazardous materials which are causing pollution within the Mine Development Envelopment. Short term management is required to address.	Post-mining landform is causing ongoing pollution/contamination within the Mine Development Envelope which will require long term management in order to meet the end land use.	The post-mining landform is causing significant ongoing pollution /contamination which impacts beyond the Mine Development Envelope. It will require ongoing management and prevent the end land use from being realised.
Social - Community and Culture	Negligible impact on community or any site of cultural significance	Short term impact on a small number of community members or receptors (<5) Minor impact within the boundary of a culturally significant site that does not impact on the heritage values present.	Medium term impact on a larger number of community members >5 that can be addressed in a timely manner and is not of ongoing concern. Site of moderate cultural significance is impacted, but not destroyed without required approvals. The impact may be able to be rectified.	Ongoing impact on moderate number of community members (>20) that can be addressed in the moderate to long term. Site of moderate cultural significance is destroyed without prior approval.	Significant, ongoing impact on the local community which causes widespread local unrest. Site of high cultural significance is destroyed without prior approval. The heritage value of the site is lost is completely lost.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