



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 9070/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Big Bell Gold Operations Pty Ltd

1.3. Property details

Property: General Purpose Lease 51/9;
Mining Lease 51/6, 51/12, 51/31, 51/33, 51/53, 51/62, 51/75, 51/96, 51/203, 51/320, 51/321,
51/334, 51/374, 51/486, 51/496, 51/524, 51/568, 51/569, 51/572, 51/575, 51/581, 51/793,
51/794, 51/795, 51/819, 51/820;
Miscellaneous Licence 51/18, 51/33, 51/34

Local Government Area: Shire of Meekatharra
Colloquial name: Nannine Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1,581.75		Mechanical Removal	Mineral Production and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 3 December 2020

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description The vegetation of the application area is broadly mapped as the following Beard vegetation associations:

18: Low woodland; mulga (*Acacia aneura*);
39: Shrublands; mulga scrub;
125: Bare areas; salt lakes; and
1128: Mosaic: Succulent steppe with open scrub; scattered *Acacia sclerosperma* & bowgada over saltbush & bluebush/Succulent steppe; samphire (GIS Database).

Several flora and vegetation surveys have been conducted over the application area by MWH (2015; 2017), NVS (2018) and Spectrum Ecology (2020).

The following vegetation associations were recorded within the southern section of the application area and surrounding area by MWH (2015) between 14 to 17 July 2015;

LB

Bare lake bed (playa) - Bare lake bed (playa).

VA01

Maireana chenopod shrubland - Scattered shrubs of *Maireana pyramidata* and *Cratystylis subspinescens* over low chenopod shrubland of *Maireana tomentosa*, *Maireana triptera* and *Dissocarpus paradoxus* over scattered low tussock grassland of *Aristida contorta* on red/brown sandy, clay loam.

VA02a

Acacia scattered tall shrubland - Scattered tall shrubs of *Acacia pteraneura* and *Acacia tetragonophylla* over scattered mid shrubs of *Senna* sp. Meekatharra (E. Bailey 1-26) and *Senna artemisioides* subsp. *helmsii* over open low shrubland of *Maireana triptera*, *Eremophila ?jucunda* subsp. *jucunda* and *Ptilotus obovatus* over very open low tussock grassland of *Aristida contorta* on red/brown loamy sand with stony surface.

VA02b

Acacia scattered tall shrubland - Scattered tall shrubs of *Acacia pteraneura* over open low chenopod shrubland of *Maireana pyramidata*, *Maireana triptera* and *Rhagodia eremaea* over very open low tussock grassland of *Aristida contorta* on red/brown stony, loamy sand with stony surface.

VA03

Tecticornia samphire shrubland - Mosaic of mid to tall samphire shrubland dominated by Tecticornia species on moist clay.

VA04

Acacia open tall shrubland - Open tall shrubland to scattered tall shrubs of *Acacia fuscaneura* and occasional *Acacia synchronicia* over open mid shrubland of *Eremophila latrobei* subsp. *latrobei*, *Senna* sp. Meekatharra (E. Bailey 1-26) and *Eremophila* spp. over scattered low shrubs of *Ptilotus obovatus* and *Solanum lasiophyllum* over open low chenopod shrubland of *Maireana triptera* and *Sclerolaena* spp. over very open low tussock grassland of *Aristida contorta* and *Enneapogon caerulescens* on skeletal red/brown loamy sand with ironstone outcropping.

VA05

Hakea open tall shrubland - Open tall shrubland to isolated patches of tall shrubs of *Hakea preissii* and *Acacia sclerosperma* subsp. *sclerosperma* over open mid shrubland to scattered mid shrubs of *Dodonaea viscosa* subsp. *angustissima*, *Maireana pyramidata* and *Cratystylis subspinescens* over scattered mid chenopod shrubs of *Maireana triptera* and *Atriplex vesicaria* over scattered low tussock grassland of *Aristida contorta* on red/orange loamy sand.

VA06

Salsola low chenopod shrubland - Scattered mid shrubs of *Maireana pyramidata* and *Eremophila longifolia* over low chenopod shrubland to low open chenopod shrubland of *Salsola australis*, *Sclerolaena diacantha* and *Dissocarpus paradoxus* over scattered low herbs of *Swainsona paradoxa* on red/orange fine clayey loam.

VA07a

Acacia scattered low trees - Scattered low trees of *Acacia fuscaneura* over open tall shrubland to isolated patches of tall shrubs of *Acacia sclerosperma* subsp. *sclerosperma* and *Hakea preissii* over open mid shrubland of *Eremophila* sp. B, *Senna artemisioides* subsp. *filifolia* and *Senna artemisioides* subsp. *helmsii* over scattered low shrubs of *Ptilotus obovatus* on orange/red clayey sand.

VA07b

Acacia scattered low trees - Scattered low trees of *Acacia pteraneura* over scattered tall shrubs of *Hakea preissii* over mid shrubland of *Senna* sp. Meekatharra (E. Bailey 1-26), *Senna* sp. Billabong (J.D. Alonzo 721) and *Eremophila* sp. A on red/orange loamy sand.

VA07c

Acacia scattered low trees - Open tall shrubland of *Acacia fuscaneura* over open mid shrubland of *Eremophila* sp. A over scattered mid chenopod shrubs of *Salsola australis*, *Maireana pyramidata* and *Maireana tomentosa* over scattered mid tussock grasses of *Eragrostis* sp. on red loamy sand.

VA08

Acacia scattered tall shrubland - Isolated patches of mid shrubs of *Acacia sclerosperma* subsp. *sclerosperma* over scattered low shrubs to open low shrubland of *Frankenia laxiflora*, *Sclerolaena fimbriolata* and *Erchylaena tomentosa* var. *tomentosa* over open low tussock grassland of *Eragrostis eriopoda* and *Enneapogon caerulescens* on orange/red loamy sand with gypsum outcropping.

VA10

Maireana chenopod shrubland - Scattered mid shrubs of *Lawrencia helmsii* and *Maireana pyramidata* over low chenopod shrubland of *Atriplex vesicaria* and *Maireana amoena* on red/brown clayey sand.

VA11

Acacia open tall shrubland - Open tall shrubland of *Acacia fuscaneura* over scattered mid shrubs to open mid shrubland of *Eremophila macmillaniana* and *Eremophila latrobei* subsp. *latrobei* over open low shrubland of *Ptilotus obovatus*, *Solanum lasiophyllum* and *Maireana pyramidata* over very open low tussock grassland of *Aristida contorta* and *Enneapogon caerulescens* on red/orange/white skeletal sandy loam with quartz outcropping.

The following vegetation associations were recorded within the central to northern section of the application area by (MWH, 2017) between 31 January to 2 February 2017;

VT01

Acacia fuscaneura tall sparse shrubland over *Eremophila macmillaniana* and *Senna glutinosa* subsp. *x luerssenii* mid sparse shrubland over *Ptilotus obovatus* and *Senna artemisioides* subsp. *helmsii* low sparse shrubland on low stony hills.

VT02

Acacia sclerosperma subsp. *sclerosperma*, *Acacia synchronicia* and *Acacia fuscaneura* tall open shrubland over *Eremophila scoparia* and *Senna artemisioides* subsp. *helmsii* mid sparse shrubland over *Sclerolaena cuneata* and *Sclerolaena diacantha* sparse dwarf chenopod shrubland on stony undulating plains, with *Tecticornia disarticulata* (glaucous form) low sparse samphire shrubland in lower drainage areas.

VT03

Acacia fuscaneura, *Acacia grasbyi* and *Acacia aptaneura* over *Senna* sp. Meekatharra (E. Bailey 1-26) mid sparse shrubland over *Sclerolaena diacantha* and *Sclerolaena cuneata* dwarf chenopod shrubland on undulating stony plains.

VT04

Acacia fuscaneura and *Acacia grasbyi* tall sparse shrubland over *Eremophila fraseri* subsp. *fraseri* and *Acacia tetragonophylla* mid sparse shrubland over *Ptilotus obovatus* low sparse shrubland on undulating stony plains.

VT05

Acacia fuscaneura and *Acacia grasbyi* tall sparse shrubland over *Eremophila latrobei* subsp. *latrobei*, *Senna* sp. Meekatharra (E. Bailey 1-26) and *Ptilotus obovatus* mid to low shrubland over *Maireana triptera* and *Sclerolaena diacantha* dwarf chenopod shrubland on rocky ironstone hill.

VT06

Acacia fuscaneura tall sparse shrubland over *Eremophila spathulata* mid sparse shrubland over *Ptilotus obovatus* low sparse shrubland on quartz and ironstone stony low slopes and plains.

VT07

Acacia aptaneura tall open shrubland over *Eremophila scoparia* and *Senna* sp. Meekatharra (E. Bailey 1-26) mid sparse shrubland on low stony rises.

VT08

Acacia fuscaneura tall sparse shrubland over *Eremophila glutinosa* and *Eremophila latrobei* subsp. *latrobei* mid sparse shrubland over *Senna artemisioides* subsp. *helmsii* and *Ptilotus obovatus* on low rocky quartz hills.

VT09

Acacia paraneura and *Acacia aptaneura* tall shrubland over *Eremophila glutinosa* and *Eremophila latrobei* subsp. *latrobei* mid open shrubland over *Cymbopogon ambiguus* isolated clumps of tussock grasses in narrow drainage channels.

VT10

Hakea preissii tall open shrubland over *Eremophila scoparia* mid sparse shrubland over *Atriplex codonocarpa*, *Sclerolaena diacantha* and *Sclerolaena cuneata* dwarf *chenopod shrubland* on stony undulating plains adjacent to drainage.

VT11

Mosaic of mid to tall samphire shrubland dominated by *Tecticornia* species on moist clay. This vegetation comprises a complex array of samphire communities dependant on separate zonation requirements.

The following vegetation associations were recorded within the north-west section of the application area by NVS (2018) between 5 to 6 March 2018;

Open Mulga Shrubland

Dominant species were *Acacia aneura*, *Acacia mulganeura*, *Acacia victoriae* subsp. *victoriae*, *Senna glutinosa* subsp. *chatelainiana* and *Eremophila fraseri* subsp. *fraseri*.

BIF Outcrop Vegetation

Dominant species were *Acacia aneura*, *A. tetragonophylla*, *Psydrax rigidula*, *Ptilotus obovatus*, *Eremophila latrobei* subsp. *latrobei* and *Ptilotus rotundifolius*.

Mulga Creepline shrubland

Dominant species were *Acacia quadrimarginea*, *A. tetragonophylla*, *A. pteraneura*, *Hibiscus coatesii*, *Eremophila forrestii* subsp. *forrestii*, *Boerhavia repleta*, *Iseilema membranaceum* and *Tragus australianus*.

The following vegetation associations were recorded within the western and north eastern sections of the application area by Spectrum Ecology (2020) between 19 to 21 April 2020;

D1 (Drainage: drainage line on flat) *Acacia aptaneura*, *Acacia caesaneura* and *Acacia macraneura* tall open shrubland, over \pm *Eremophila pantonii*, \pm *Eremophila youngii* subsp. *youngii* and *Acacia tetragonophylla* mid sparse shrubland, over \pm *Aristida contorta* and \pm *Setaria dielsii* low sparse tussock grassland.

D2 (Drainage: salt pan)

Tecticornia peltata, *Tecticornia* sp. 1 and *Tecticornia pergranulata* subsp. *pergranulata* low sparse shrubland, over *Eragrostis pergracilis* low sparse tussock grassland, over *Heliotropium curassavicum* and *Dysphania plantaginella* low isolated clumps of forbs.

F1 (Flat: plains)

Acacia aptaneura, \pm *Hakea preissii* and \pm *Acacia ? demissa* tall sparse shrubland, over \pm *Eremophila fraseri* subsp. *fraseri*, *Acacia tetragonophylla* and \pm *Santalum lanceolatum* mid sparse shrubland, over \pm *Enneapogon caeruleus* and \pm *Aristida contorta* low sparse tussock grassland.

F2 (Flat: plains)

Senna glutinosa, *Acacia synchronicia* and *Rhagodia drummondii* mid sparse shrubland, over *Ptilotus obovatus* and *Solanum lasiophyllum* low sparse shrubland, over *Aristida contorta* and *Enneapogon caeruleus* isolated tussock grasses.

S1 (Hill: ridges and crests)

Acacia aptaneura tall sparse shrubland, over *Senna artemisioides* and *Eremophila macmillaniana* mid sparse shrubland, over *Ptilotus obovatus* low sparse shrubland.

Clearing Description

Nannine Project.
Big Bell Operations Pty Ltd proposes to clear up to 1,581.75 hectares of native vegetation within a boundary of approximately 1,616 hectares, for the purposes of mineral production and associated activities. The project is located approximately 33 kilometres south-west of Meekatharra, within the Shire of Meekatharra.

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

To;

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition was derived from flora and vegetation surveys conducted by MWH (2015; 2017), NVS (2018) and Spectrum Ecology (2020).

Degraded areas within the application area have resulted from historical mining and grazing (MWH, 2015).

3. Assessment of application against Clearing Principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments**Proposal may be at variance to this Principle**

The clearing permit application area is located within the Western Murchison subregion of the Interim Biogeographic Regionalisation for Australia Murchison Bioregion (GIS Database). The Western Murchison subregion is characterised by Mulga low woodlands, often rich in ephemerals (usually with bunch grasses). Surfaces associated with the occluded drainage occur throughout with hummock grasslands on Quaternary sandplains, saltbush shrublands on calcareous soils and Tecticornia low shrublands on saline alluvia (CALM, 2002).

Flora and vegetation surveys have identified 33 vegetation units within the application area (MWH, 2015, 2017; NVS, 2018; Spectrum Ecology, 2020). None of the vegetation communities within the application area have been identified as a Threatened or Priority Ecological Community (PEC) (GIS Database). The application area sits partially within the buffer of the 'Polelle calcrete groundwater assemblage type on Murchison palaeodrainage on Polelle Station PEC', but is not within the mapped extent (GIS Database).

There are no records of Threatened flora species within the application area (MWH, 2015, 2017; NVS, 2018; Spectrum Ecology, 2020). There were three priority taxa considered likely to occur within the application area; *Acacia sclerosperma* subsp. *glaucescens* (Priority 3), *Ptilotus lazaridis* (Priority 3) and *Acacia speckii* (Priority 4) (MWH, 2015; 2017). These species were not identified during the flora and vegetation surveys, however *Acacia sclerosperma* subsp. *glaucescens* has been previously recorded within the application area (Spectrum Ecology, 2020). *Acacia sclerosperma* subsp. *glaucescens* and *Acacia speckii* are both readily identifiable from vegetative material, while *Ptilotus lazaridis* would have been flowering at the time of the flora survey ensuring a confident identification if present (MWH, 2015).

There was one Priority flora species recorded within the application area; *Tecticornia cymbiformis* (Priority 3) (MWH, 2017). This species is associated with saline soils and is found along the edges of creeklines (WA Herbarium, 1998-). There are only seven records from Lake Annean recorded in FloraBase which are almost 20 years old (WA Herbarium, 1998-). Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a Priority flora condition. Another Priority flora taxa not identified by the database search, *Dodoniaea ? amplisemina* (Priority 4) was possibly collected during the survey, but could not be confirmed due to the specimen being sterile (MWH, 2017). Given that there was only one individual identified within the application area, the proposed clearing of one potential *Dodoniaea amplisemina* is not likely to impact the conservation significance of the species. MWH (2017) also recorded two novel (undescribed) flora taxon, *Tecticornia* sp. nov and *Eremophila* sp. nov within the application area, and these species have been vouchered with the Western Australian Herbarium for further taxonomic work. Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a Priority flora condition.

The vegetation type D2 has been identified as significant as it is a restricted salt lake vegetation type (Spectrum Ecology, 2020). The Tecticornia dominated vegetation of D2 on the salt pan at the eastern edge of the survey area is habitat for many Tecticornia species, including the potentially novel *Tecticornia* sp. nov (MWH, 2017; Spectrum Ecology, 2020). Potential impacts to this vegetation type as a result of the proposed clearing may be minimised by the implementation of condition that does not allow clearing within this vegetation type.

The application area sits partially within Lake Annean, which is on the Directory of Important Wetlands because it forms an important wetland that supports foraging and breeding habitat for a number of migratory waterbirds after periods of inundation (MWH, 2015).

Several weed species have been identified within the application area (MWH, 2015, 2017; NVS, 2018; Spectrum Ecology, 2020). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Care should be taken to ensure that weeds do not get introduced into the area as the result of clearing activities. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology

CALM (2002)
MWH (2015)
MWH (2017)
NVS (2018)
Spectrum Ecology (2020)
WA Herbarium (1998-)

GIS Database:

- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- Threatened Fauna

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal may be at variance to this Principle

The following nine broad fauna habitats have been recorded within the application area (MWH, 2015, 2017; Spectrum Ecology, 2020):

- Dunefields;
- Samphire;
- Lake Playa;
- Open Plain;
- Mulga Woodland;
- Drainage Line;
- Quartz Outcrop;
- Stony Plain; and
- Ironstone Hills.

The application area is located partially within Lake Annean (GIS Database). Lake Annean is known to support a number of protected migratory waterbirds (DAWE, 2020). Several marine waterbirds were recorded within the application area (MWH, 2015). The samphire habitat within the application area would provide foraging and breeding habitat for bird species when the lake is flooded (MWH, 2015). As the lake playa contains no vegetation there will be no clearing in this habitat. Big Bell (2020) advises that only 6.34 hectares of vegetation within Lake Annean will be disturbed by the proposed clearing of native vegetation, some of which may include the Samphire habitat. Potential impacts to the Samphire habitat as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

There was one conservation significant fauna species recorded within the application area; the Priority 1 Meekatharra Slider (*Lerista eupoda*) (MWH, 2015). This species was recorded at two locations within the Dunefield habitat (MWH, 2015). This species is restricted to the Murchison region in an area between Meekatharra and Cue (DBCA, 2007-). Potential impacts to the Meekatharra Slider as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition. Further survey work to determine the extent of the Dunefield habitats and the Meekatharra Slider in the local area is recommended.

The Quartz Outcrop habitat extent is considered limited within the application area, however this habitat type was not considered significant to fauna of conservation significance given the high disturbance of the surrounding area (MWH, 2017).

The Ironstone Hills habitat is widespread within the local and regional area. The surface and substrate consisted of a high proportion of stony fragments which is not preferential for burrowing species. Given the degraded condition of this habitat and the limited shelter the habitat provides, it was not likely to support species of conservation significance (MWH, 2017).

The Open Plain habitat was the most widespread within the local and regional area. Given the very limited vegetation present within this habitat type, there is minimal refuge and foraging resources for conservation significant fauna (Spectrum Ecology, 2020).

The Stony Plain, Mulga Woodland and Drainage Line habitats were all widespread within the local and regional area (MWH, 2017). These habitat types may provide refuge and foraging habitat various mammal, avifauna and reptiles, including some migratory birds and conservation significant fauna (MWH, 2015; Spectrum Ecology, 2020). These habitats are common in the surrounding area and are likely to be used by fauna species as a part of a larger range. It is therefore unlikely that fauna species would be specifically reliant on these habitat types within the application area.

There are several species of conservation significance that are likely to occur within the application area based on suitable habitat types (MWH, 2015, 2017; Spectrum Ecology, 2020);

- Fairy shrimp (*Branchinella simplex*) (Priority 1);
- Long-tailed Dunnart (*Sminthopsis longicaudata*) (Priority 4);
- Grey Falcon (*Falco hypoleucos*) (VU); and
- Peregrine Falcon (*Falco peregrinus*) (OS).

The fairy shrimp has the potential to occur within Lake Annean after periods of inundation (MWH, 2017). However given that Lake Annean is over 20,000 hectares in size, the proposed clearing of 6.34 hectares of vegetation within Lake Annean is unlikely to significantly impact this species.

The Long-tailed Dunnart may utilise the stony plains within the application area, although this is not the preferred habitat type for this species (Spectrum Ecology, 2020).

Both the Grey Falcon and Peregrine Falcon may utilise the application area as part of a larger home range, however there is no suitable breeding habitat within the application area (Spectrum Ecology, 2020).

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Big Bell (2020)
DAWE (2020)
DBCA (2007-)
MWH (2015)
MWH (2017)
Spectrum Ecology (2020)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal is not likely to be at variance to this Principle

There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species of Threatened flora (MWH, 2015; 2017; NVS, 2018; Spectrum Ecology, 2020). The vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MWH (2015)
MWH (2017)
NVS (2018)
Spectrum Ecology (2020)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority Flora

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is not likely to be at variance to this Principle

According to available databases, there are no records of any Threatened Ecological Communities (TECs) within the application area (GIS Database). The vegetation surveys of the application area did not identify any vegetation communities considered to be a TEC within the application area (MWH, 2015, 2017; NVS, 2018; Spectrum Ecology, 2020).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MWH (2015)
MWH (2017)
NVS (2018)
Spectrum Ecology (2020)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not at variance to this Principle

The application area falls within the Murchison Bioregion of the Interim Biogeographic Regionalisation for Australia (GIS Database). Approximately 99.73% of the pre-European vegetation still exists in the Murchison Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard

vegetation associations 18, 39, 125 and 1128 (GIS Database). These vegetation associations have not been extensively cleared as over 98% of the pre-European extent of these vegetation associations remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). The application area does not contain any remnants nor does it form part of any remnants in the local area (GIS Database).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Government of Western Australia (2019)

GIS Database:

- IBRA Australia
- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments **Proposal is at variance to this Principle**

There are no permanent waterbodies within the application area (GIS Database). The application area is situated over part of the non-perennial Lake Annean (GIS Database). Lake Annean is largely dry and fills every five to ten years (DAWE, 2020). Lake Annean is listed in the Directory of Important Wetlands in Australia due to it being an important breeding area for waterbirds and a good example of a seasonal saline lake and marsh system (DAWE, 2020).

The samphire communities associated with Lake Annean, in particular vegetation types VA03 and VT11, are considered to be groundwater dependent ecosystems and are important as foraging and breeding habitat for migratory birds visiting Lake Annean (MWH, 2015; 2017). The proposed clearing will only impact 7.38 hectares within Lake Annean, however 1.04 hectares of this will occur within areas that have already been disturbed by existing mine features (Big Bell, 2020). Vegetation type D2 has been identified as significant as it is restricted within the application area and may be a habitat type for a potential new species (*Tecticornia* sp. nov) (Spectrum Ecology, 2020). Potential impacts to this vegetation type as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition to vegetation type D2.

The clearing of riparian vegetation has the potential to cause localised erosion and degrade faunal habitats. However, given the proposed clearing is spread over a large area, it is not anticipated that it will have a significant impact on Lake Annean, which is over 12,000 hectares in size (GIS Database). Provided disturbance to riparian habitats is avoided or minimised where possible, and weed hygiene procedures are followed, the proposed works are not expected to substantially impact these vegetation units. Potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management condition.

Based on the above, the proposed clearing is at variance to this Principle

Methodology Big Bell (2020)
DAWE (2020)
MWH (2015)
MWH (2017)
Spectrum Ecology (2020)

GIS Database:

- Hydrography, Lakes
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments **Proposal may be at variance to this Principle**

The application area lies within the Gabanintha, Violet, Wiluna, Austin and Carnegie land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

The Gabanintha land system is described as greenstone ridges and hills supporting sparse acacia shrublands. This land system is not generally susceptible to erosion, except for narrow drainage tracts which are mildly susceptible to water erosion (Payne et al., 1998).

The Violet land system consists of undulating stony and gravelly plains and low rises supporting mulga shrublands. This land system may be susceptible to erosion if vegetation cover is removed, for example by the construction of tracks and gridlines. In such circumstances the soil becomes moderately susceptible to water erosion. Narrow drainage tracts are mildly susceptible to water erosion (Payne et al., 1998).

The Wiluna land system consists of greenstone hills, breakaways and lower plains supporting mulga shrublands occasionally with understoreys of halophytic shrubs. This land system is not generally susceptible to erosion (Payne et al., 1998).

The Austin land system consists of saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga. This land system is not generally susceptible to erosion (Payne et al., 1998).

The Carnegie land system consists of salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting halophytic shrublands. Wind erosion of lake margins may be exacerbated by loss of stabilising perennial shrubs (Payne et al., 1998).

Potential impacts from land degradation as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Payne et al. (1998)

GIS Database:
- Landsystem Rangelands

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not likely to be at variance to this Principle

The application area does not lie within any conservation areas or Department of Parks and Wildlife managed lands (GIS Database). The nearest conservation area is the ex Lakeside lease which is located approximately 85 kilometres south-west of the application area (GIS Database). The proposed clearing will not impact on the environmental values of this area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- DPaW Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

There are no permanent watercourses within the application area (GIS Database). The non-perennial Lake Annean is located within the application area (GIS Database). The proposed clearing of native vegetation and mining activities should not impact on drainage or surface water quality, provided sediments are controlled during construction and operation by implementing standard management procedures (MWH, 2017).

The application area is not located within a Public Drinking Water Source Area (GIS Database). The groundwater in the application area is considered to be brackish to saline ranging from 3,000 to 7,000 milligrams/litre total dissolved solids (GIS Database). The proposed clearing is not expected to have any impact on the quality of groundwater in the local area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MWH (2017)

GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

With an average annual rainfall of 235.8 millimetres and an average annual evaporation rate of 2,800 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2020; GIS Database). Given the likelihood of little surface flow, the proposed clearing is not likely to cause or increase the incidence or intensity of flooding.

The application area sits partially within Lake Annean, where temporary localised flooding may occur briefly following heavy rainfall events, with the whole lake filling from episodic flooding every five to ten years (DAWE, 2020; GIS Database). However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2020)
DAWE (2020)

GIS Database:
- Hydrographic Catchments - Catchments
- Hydrography, linear
- Imagery

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 19 October 2020 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (DPLH, 2020). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2020). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Methodology DPLH (2020)

4. References

- Big Bell (2020) Additional information received in relation to Clearing Permit Application CPS 9070/1. Big Bell Operations Pty Ltd, Western Australia.
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- DAWE (2020) Directory of Important Wetlands. Department of Agriculture, Water and the Environment. http://www.environment.gov.au/cgi-bin/wetlands/report.pl?smode=DOIW&doiw_refcodelist=WA056 (Accessed 30 November 2020).
- DBCA (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Biodiversity, Conservation and Attractions. <https://naturemap.dbca.wa.gov.au/> (Accessed 1 December 2020).
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- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- MWH (2015) Lake Annean Flora and Fauna Assessment. Prepared for Metals X Limited by MWH Australia Pty Ltd, September 2015.
- MWH (2017) Aladdin Project: Reconnaissance Flora and Fauna Assessment. Prepared for Westgold Resources Limited by MWH Australia Pty Ltd, March 2017.
- NVS (2018) Reconnaissance Flora and Vegetation Survey Golden Shamrock Prospect, Central Murchison Gold Project. Prepared for Westgold Resources Limited/Big Bell Gold Operations Pty Ltd, by Native Vegetation Solutions, May 2018.
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- Spectrum Ecology (2020) Nannine Mining area Reconnaissance Flora & Level 1 Fauna Assessment. Prepared for Westgold Resources Limited by Spectrum Ecology Pty Ltd, June 2020.

5. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation*

(*Specially Protected Fauna*) Notice 2018 for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU

Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX

Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW

Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI

Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD

Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS

Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P**Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1**Priority One - Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2**Priority Two - Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3**Priority Three - Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4**Priority Four - Rare, Near Threatened and other species in need of monitoring**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.