Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6259/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Saracen Metals Pty Ltd**

1.3. Property details

Property:
Mining Lease 36/503
Mining Lease 36/504
Mining Lease 36/512
Mining Lease 36/525
Mining Lease 36/542
Mining Lease 36/582
Mining Lease 37/339
Mining Lease 37/340
Mining Lease 37/356
Mining Lease 37/357
Mining Lease 37/358
Mining Lease 37/359
Mining Lease 37/367
Mining Lease 37/368
Mining Lease 37/437
Mining Lease 37/465
Mining Lease 37/493
Mining Lease 37/998
Miscellaneous Licence 36/158
Miscellaneous Licence 36/181
Miscellaneous Licence 36/188
Miscellaneous Licence 36/193
Miscellaneous Licence 36/202
Miscellaneous Licence 37/61
Miscellaneous Licence 37/73
Miscellaneous Licence 37/142
Miscellaneous Licence 37/166
Miscellaneous Licence 37/199

Local Government Area: Shire of Leonora
Colloquial name: North Eastern Goldfields Operations

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
500		Mechanical Removal	Mineral Production

1.5. Decision on application

Decision on Permit Application:
Decision Date:

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. One Beard vegetation association has been mapped within the application area:

18: Low woodland; mulga (*Acacia aneura*) and
28: Open low woodland; mulga
39: Shrublands; mulga scrub, and
84: Hummock grasslands, open low tree and mallee steppe; marble gum and mallee (*Eucalyptus youngiana*) over hard spinifex *Triodia basedowii* between sand hills.

A Level 1 flora and vegetation survey was conducted over the application area by Botanica Consulting (Botanica,

2014). A total of 18 vegetation communities were recorded within the application area, including:

TBA_01: Low woodland of *Acacia aptaneura* over open low scrub of *Thryptomene decussata* and open dwarf scrub of *Dodonaea microzyga/* dwarf scrub of *Ptilotus obovatus/* very open low grass of *Monachather paradoxus* on breakaway;

TBA_02: Open low woodland of *Acacia aptaneura/ Acacia mulganeura* over open dwarf scrub of *Eremophila conglomerata* and very open low grass of *Monachather paradoxus* on hill slope;

TBA_03: Open low woodland of *Acacia aptaneura/ Acacia mulganeura* over open scrub of *Acacia ramulosa* and very open low grass of *Monachather paradoxus*;

TBA_04: Open low woodland of *Acacia aptaneura/ Acacia mulganeura* over dwarf scrub of *Eremophila spectabilis* subsp. *brevis* and low grass of *Monachather paradoxus*;

SY_01: Open low woodland of *Acacia aptaneura*/ *Acacia mulganeura* over dwarf scrub of *Eremophila margarethae* and low grass of *Monachather paradoxus*;

SY_02: Open low woodland of *Hakea preissii* over open low scrub if *Senna* sp. Meekatharra (E. Bailey 1-26) and dwarf scrub of *Maireana glomerifolia/ Tecticornia disarticulata*;

SY_03: Open low woodland of *Acacia aptaneura* over low scrub of *Hakea preissii* and open dwarf scrub of *Maireana triptera*;

SY_04: Open low woodland of *Acacia aptaneura* over low scrub of *Senna artemisioides* subsp. *helmsii* and open dwarf shrub *Ptilotus obovatus*/ *Maireana triptera* on hill slope;

SY_05: Thicket of *Acacia burkittii* over open low scrub of *Senna artemisioides* subsp. *filifolia* and open dwarf scrub of *Ptilotus obovatus/ Sida* sp. Excedentifolia (J.L. Egan 1925);

SY_06: Open low woodland of *Acacia aptaneura* over open low scrub of *Senna artemisioides* subsp. *filifolia* and open low grass of *Enneapogon caerulescens*/ open dwarf scrub of *Ptilotus obovatus*/ *Solanum lasiophyllum*;

PHR_01: Open low woodland of *Acacia aptaneura*/ *Acacia mulganeura* over open scrub of *Acacia tetragonophylla*/*Acacia craspedocarpa* and open dwarf scrub of *Ptilotus obovatus*/ open low grass *Aristida contorta*;

WS_01: Low woodland of *Acacia aptaneura* over open low scrub of *Eremophila platycalyx*/ *Senna* sp. Meekatharra (E. Bailey 1- 26) and open low grass *Aristida contorta/* very open herbs of *Cheilanthes sieberi* subsp. *sieberi*;

WS_02: Low woodland of *Acacia aptaneura/ Acacia mulganeura* over low scrub *Acacia tetragonophylla* and very open low grass of *Monachather paradoxus* in creekline;

WS_03: Open low woodland of *Acacia aptaneura* over open dwarf scrub of *Eremophila pantonii* and herbs of *Sclerolaena densiflora*;

WS_04: Low woodland of *Acacia aptaneura* over open low scrub of *Eremophila platycalyx* and very open low grass *Aristida contorta* in flood plain;

WS_05: Forest of *Acacia aptaneura* over heath of *Eremophila forrestii*/ low scrub of *Eremophila conglomerata* and low grass of *Monachather paradoxus*;

WS_06: Open low woodland of *Acacia incurvaneura*/ *Acacia aptaneura*/ *Acacia mulganeura* and open scrub of *Acacia ramulosa* and low grass of *Aristida contorta*; and

WS_07: Open low woodland *Acacia aptaneura* over scrub of *Eremophila fraseri* and open dwarf scrub *Ptilotus obovatus/* very open low grass of *Aristida contorta*.

Clearing Description

North Eastern Goldfields Operations.
Saracen Metals Pty Ltd (Saracen) proposes to clear up to 500 hectares within a total boundary of 5,568.52 hectares for the purpose of mineral production. The project is located approximately 26.3 kilometres south-east of Leinster, in the Shire of Leonora.

Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994);

To:

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

Comment

The clearing permit boundary encompasses the 'North Eastern Goldfields Operations' which amalgamates the former Thunderbox and Bannockburn Gold Projects and Waterloo Nickel Project. Vegetation condition was determined during the Level 1 flora and vegetation survey conducted by Botanica (2014). Ten of the 18 vegetation communities recorded within the application area were in an overall 'Very Good' condition, however large areas within two vegetation communities were 'Degraded' due to previous mining activity. The remaining eight vegetation communities were in 'Good' condition.

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 is not likely to be at variance to this Principle

The application is located within the East Murchison subregion of the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The East Murchison subregion is characterised by internal drainage and elevated red desert sandplains, dominated by Mulga Woodland with hummock grasslands and saltbush or Halosarcia shrublands (CALM, 2002).

The vegetation within the application area is mapped as belonging to Beard associations 18, 28, 39 and 84 (GIS Database). A Level 1 flora and vegetation survey of the North Eastern Goldfields project area was conducted by Botanica (2014). A total of 18 vegetation associations were recorded within the application area, which ranged from Degraded to Very Good condition (Keighery, 1994; Botanica, 2014). A total of 136 flora taxa from 32 families and 74 genera were recorded by Botanica (2014). Floristic diversity within the application area is considered to be high, however Botanica (2014) advise that most species have wide distributions and occur in one or more subregions. Using the Naturemap database (DPaW, 2014a), 10 priority flora species and no Threatened flora species are known to occur within 20 kilometres of the application area. Previous flora surveys in the vicinity of the application area recorded three Priority flora species, including *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (Priority 1), *Calytrix uncinata* (Priority 3) and *Sauropus ramosissimus* (Priority 3) (Paul Armstrong and Associates, 2001; 2004 as cited in Botanica, 2014).

During the flora survey, one population with approximately 20 individuals of *Calytrix uncinata* was recorded within the application area (Botanica, 2014). This species was the only conservation significant taxa recorded during the flora survey (Botanica, 2014). *Calytrix uncinata* has a relatively broad distribution, occurring across both the Murchison and Yalgoo bioregions (DPaW, 2014b). A total of 10.2 hectares of suitable habitat for this species occurs within the application area (Botanica, 2014). With consideration to the distribution of this species and the area of suitable habitat within the application boundary, the proposed clearing is not likely to impact the conservation of this species.

None of the vegetation communities represented a Threatened Ecological Community (TEC) or Priority Ecological Community (PEC), which is consistent with available databases (GIS Database).

A total of nine introduced flora species were recorded within the application area, including Buffel Grass (*Cenchrus ciliaris*), Ruby Dock (*Acetosa vesicaria*), Pie Melon (*Citrullus lanatus*), Prickly Paddy Melon (*Cucumis myriocarpus*), Doublegee (*Emex australis*), Blue Pimpernel (*Lysimachia arvensis*), Wild Sage (*Salvia verbenaca*), Nightshade (*Solanum nigram*), and Common Sowthistle (*Sonchus oleraveus*) (Botanica, 2014). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area (DEC, 2011). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Using a 20 kilometre search radius, the NatureMap database returned results for 54 avian, 12 reptile and two mammal species (DPaW, 2014a). The low number of fauna species recorded is likely to represent search effort rather than a depauperate fauna community. A fauna assessment was conducted within the northern extent of the application area (Thunderbox project area) in 2001 by Bamford Consulting Ecologists (Bamford, 2001). A total of 98 avian, 50 reptile, five amphibian and 25 mammal species were considered likely or known to occur within the application area, including six introduced species (Bamford, 2001). A Level 2 Fauna Survey was conducted adjacent to the Bannockburn project area (within the south extent of the application area) by Biota (2006), and identified 45 avian, 23 reptile, one amphibian and 12 mammal species, of which three were introduced.

A number of conservation significant fauna species may be present within the application area, including the Malleefowl (*Leipoa ocellata*; Schedule 1), Peregrine Falcon (*Falco peregrinus*; Schedule 4), Grey Falcon (*Falco hypoleucos*; Schedule 1), Australian Bustard (*Ardeotis australis*; Priority 4), Bush Stone-curlew (*Burhinus grallarius*; Priority 4), Major Mitchell's Cockatoo (*Lophocroa leadbeateri*; Priority 4), Princess Parrot (*Polytelis alexandrae*; Priority 4), Night Parrot (*Pezoporus occidentalis*; Schedule 1), Striated Grasswren (*Amytornis striatus striatus*; Priority 4), Greater Bilby (*Macrotis lagotis*; Schedule 1), and Chuditch (*Dasyurus geoffreyi*; Schedule 1) (Bamford, 2001; Biota, 2006; Saracen, 2014a). However, of these only the Malleefowl is highly likely to be dependent on habitat within the application area.

Both fauna surveys by Bamford (2001) and Biota (2006) advised that the local area was not likely to represent an area of unusually high fauna diversity for the Goldfields region. Furthermore, large areas have been previously cleared for mining and associated infrastructure, and the remaining fauna community is unlikely to represent an area of high biodiversity.

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

Methodology

Bamford (2001)
Biota (2006)
Botanica (2014)
CALM (2002)

DEC (2011)
DPaW (2014a)
DPaW (2014b)
Keighery (1994)
Saracen (2014a)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Pre-European Vegetation
- Threatened Ecological Sites Buffered

(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 is not likely to be at variance to this Principle

A Fauna assessment was conducted over the Thunderbox project area in 2001 by Bamford Consulting Ecologists (Bamford, 2001). A total of two habitat types were recorded within this portion of the application area, including (Bamford, 2001):

Mulga woodland on loam; and
Mulga woodland on undulating rocky loam with minor drainage lines.

A fauna survey was conducted adjacent to the Bannockburn project area (west of the application area) by Biota Environmental Sciences in 2006 (Biota, 2006). With consideration to the findings by Botanica (2014) and available aerial imagery (GIS Database), the habitat types identified by Biota (2006) are likely to represent habitat within the southern portion of the application area, and include:

Flat loamy plains;
Low stony hillslopes; and
Drainage lines.

Based on aerial imagery, the habitat types within the application boundary are widespread in the surrounding region (GIS Database). The application area is not likely to contain significant habitat features which are restricted on a local or regional scale.

A total of 11 conservation significant fauna may potentially occur in or around the application area (Bamford, 2001; Biota, 2006). Of these, bird species including the Peregrine Falcon (*Falco peregrinus*; Schedule 4), Grey Falcon (*Falco hypoleucos*; Schedule 1), Australian Bustard (*Ardeotis australis*; Priority 4), Bush Stone-curlew (*Burhinus grallarius*; Priority 4), Major Mitchell's Cockatoo (*Lophocroa leadbeateri*; Priority 4), Princess Parrot (*Polytelis alexandrae*; Priority 4), Night Parrot (*Pezoporus occidentalis*; Schedule 1), and Striated Grasswren (*Amytornis striatus striatus*; Priority 4) may occur intermittently when moving through the area, but are not likely to be dependent on habitat within the application area (Bamford, 2001).

The Malleefowl (*Leipoa ocellata*; Schedule 1) has been observed recently within the project area, however no targeted searches have occurred to locate active Malleefowl mounds. Saracen (2014a) have committed to conducting searches for Malleefowl mounds prior to clearing, and have advised that a 100 metre buffer will be implemented around any identified active mounds. Vegetation within the application area is consistent with habitat suitable for this species, and therefore there is a high likelihood for Malleefowl to use the area for breeding. Impacts to Malleefowl may be minimised by the implementation of a fauna management condition which requires targeted searches be conducted prior to clearing activity.

The Greater Bilby occurs within *Triodia* hummock grassland and *Acacia* scrub across parts of Western Australia (Biota, 2006). This species was recorded in 1981 within 2 kilometres of the application area (DPaW, 2014a). Suitable habitat occurs within the application area; however, historic habitat disturbance has occurred from mining activity within the application area, and both Bamford (2001) and Biota (2006) noted the presence of feral fauna species, which are likely to out-compete or predate on the Greater Bilby. This, coupled with the current distribution estimates provided in Pavey (2006), suggests that the Greater Bilby is not likely to occur within the application area or surrounds, and is unlikely to be impacted by the proposed clearing.

The Chuditch may occur in the general region in low numbers (Bamford, 2001; DEC, 2012), but this cannot be confirmed in the absence of targeted surveys. The management plan for Chuditch in Western Australia advises that the majority of the remaining Chuditch populations occur in the south-west corner of WA and the south coast, with occasional records from woodland and mallee shrubland in the Wheatbelt and Goldfield regions (DEC, 2012). However, historic mining activity which has occurred within the application area is likely to have discouraged Chuditch occurrence in and around the application area, and the proposed clearing is not likely to impact habitat significant for the persistence of this species.

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

Methodology

Bamford (2001)
Biota (2006)
DEC (2012)
Pavey (2006)

Saracen (2014a)
GIS Database:
- Weebo 1.4m Orthomosaic - Landgate 2003
- Wildara 1.4m Orthomosaic - Landgate 2003

(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

According to available databases, no Threatened flora have been recorded within 20 kilometres of the application area (DPaW, 2014a). No Threatened flora species were recorded within the application area during the Level 1 flora and vegetation survey conducted by Botanica (2014).

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

Methodology

Botanica (2014)
DPaW (2014a)

(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 known Threatened Ecological Communities (TECs) within the application area (GIS Database). Similarly, the vegetation survey conducted by Botanica (2014) did not identify any of the vegetation recorded as being a TEC.

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

Methodology

Botanica (2014)

(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 Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 99.7% of the pre-European vegetation remains (see table) (Government of Western Australia, 2013; GIS Database).

The vegetation within the application area has been mapped as Beard vegetation associations 18, 28, 39 and 84 (GIS Database). Over 90% of these Beard vegetation associations remain at both a state and bioregional level (Government of Western Australia, 2013). Based on aerial imagery, the vegetation within the application area is neither a remnant itself nor does it form part of any remnants within the local area (GIS Database).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Lands
IBRA Bioregion – Murchison	28,120,587	28,044,823	~99.7	Least Concern	7.7
Beard veg assoc. – State					
18	19,892,305	19,843,727	~99.8	Least Concern	6.3
28	395,895	392,172	~99.1	Least Concern	0.0
39	6,613,569	6,602,580	~99.8	Least Concern	12.1
84	1,799,366	1,799,366	~100.0	Least Concern	9.2
Beard veg assoc. – Bioregion					
18	12,403,172	12,363,252	~99.7	Least Concern	5.0
28	224,292	220,584	~98.4	Least Concern	0.0
39	1,148,400	1,138,065	~99.1	Least Concern	3.6
84	17,833	17,833	~100.0	Least Concern	0.7

* Government of Western Australia (2013)
** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- Pre-European Vegetation
- Weebo 1.4m Orthomosaic - Landgate 2003
- Wildara 1.4m Orthomosaic - Landgate 2003

(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

Two vegetation communities within the application area were recorded in association with ephemeral watercourses and are considered to be riparian in nature, including (Botanica, 2014):

WS_02: Low woodland of *Acacia aptaneura/ A. mulganeura* over low scrub *A. tetragonophylla* & very open low grass of *Monachather paradoxus* in creekline; and

WS_04: Low woodland of *A. aptaneura* over open low scrub of *Eremophila platycalyx* & very open low grass *Aristida contorta* in flood plain.

A total of 276.7 and 1,113 hectares of these vegetation communities occur within the application boundary, respectively (Botanica, 2014). Neither of the two riparian vegetation communities had a high floristic diversity, or provided habitat for conservation significant flora (Botanica, 2014). Therefore, neither vegetation community is likely to be of conservation significance on a local or regional scale. Saracen (2014b) have advised that infrastructure will be placed as far as possible from drainage lines, and that culverts or floodways will be installed on roads which cross surface water to maintain water flow to downstream vegetation. One road constructed by previous mine operators has obstructed water flow and caused approximately 25 hectares of vegetation damage within WS_04 (Botanica, 2014). Saracen has advised that water flow will be reinstated in this area by the implementation of culverts. Further impacts to riparian vegetation may be minimised by the implementation of a watercourse management condition.

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

Methodology Botanica (2014)
Saracen (2014b)

(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 over 14 land systems, including the Bevon, Duketon, Gransal, Gundockerta, Jundee, Laverton, Leonora, Monitor, Monk, Nubev, Rainbow, Tiger, Violet, and Wilson land systems (GIS Database). Of these land systems, ten are moderately to highly susceptible to soil erosion. Water erosion within these land systems is a particular risk when areas of surface water drainage are disturbed (Pringle et al., 1994; Saracen, 2014a).

Although the soil type outside of water drainage areas generally consists of shallow soils on hardpan or a stony mantle (Pringle et al., 1994), the removal of vegetation on a large scale leads to an increased potential for topsoil erosion and water erosion following heavy rainfall. Land degradation as a result of wind or water erosion may be minimised by the implementation of a staged clearing condition.

Land degradation has occurred within the application area as a result of previous mining activity. A pre-existing tailings storage facility (TSF) has been the source of dust which has impacted vegetation within the Thunderbox project area (Botanica, 2014). A licence subject to conditions has been granted by the Department of Environment Regulation (DER) to manage this issue, and liaison with DER has ensured that the grant of a clearing permit will not impact on TSF management.

A total of nine weed species have been recorded within the application area (Botanica, 2014). Of these, *Emex australis* (Doublegee) is a Declared Plant under the *Biosecurity and Agriculture Management Act 2007* (DAFWA, 2014). In addition, a road constructed by the previous Bannockburn mine operators currently obstructs surface water flow within the Bannockburn project area, and has caused water pooling to the east and vegetation starvation to the west of the road (Botanica, 2014). This matter will be addressed under the *Mining Act 1978*. Further land degradation as a result of weed invasion and the obstruction of surface water flow may be minimised by the implementation of a weed management condition and a watercourse management condition.

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

Methodology Botanica (2014)
DAFWA (2014)
Pringle et al. (1994)

Saracen (2014a)

(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 managed by the Department of Parks and Wildlife (GIS Database). The nearest conservation area is the Bulga Downs former pastoral lease, which is proposed for conservation and is located approximately 55 kilometres west of the application area (GIS Database). From this distance, the proposed clearing is not likely to impact the environmental values of this conservation area.

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

Methodology

GIS Database:
- DEC 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 may be at variance to this Principle

The application area does not occur within a Public Drinking Water Source Area (PDWSA), however it is located within the proclaimed Goldfields groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for the purposes other than domestic and/or stock watering is subject to licence by the Department of Water. The application area covers a large number of minor, non-perennial watercourses, and two earth dams (GIS Database). The northern Thunderbox Mining Area occurs upstream over second and third order tributaries of Wilson Creek (Saracen, 2014a). The creek and associated drainage lines become inundated and form small temporary pools following rainfall, which is highest during the months of December to March (Saracen, 2014a).

The southern Bannockburn Mining Area occurs within floodplains and minor drainage lines associated with two creeks which flow in a south westerly direction (Saracen, 2014a; GIS Database). Surface water flow is currently impeded by a road which runs across two tenements in this area, causing pooling and water starvation either side of the road. This issue will be addressed under the *Mining Act* 1978.

Saracen (2014b) has advised that any further clearing within watercourses will be minimised, and that culverts will be used where infrastructure has the potential to impede the flow of surface water. The clearing of native vegetation also has the potential to destabilise soils and cause temporary sedimentation to watercourses, especially within many of the land systems which occur within the application area (Pringle et al., 1994; GIS Database). Impacts to surface water within and adjacent to the application area may be minimised by the implementation of a watercourse management condition.

Groundwater salinity in the local area is estimated to be between 500 - 7,000 milligrams/Litre Total Dissolved Solids (TDS), which is considered marginal to saline (GIS Database). The proposed clearing activity is not likely to cause deterioration of groundwater within the project area.

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

Methodology

Pringle et al. (1994)
Saracen (2014a)
Saracen (2014b)
GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)
- Rangeland Land System Mapping
- RIWI Act, Groundwater 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

Mean annual rainfall in Leinster is approximately 260 millimetres (BoM, 2014). Following rainfall, temporary water pools are known to occur within creeklines (Saracen, 2014a). Floodplains are also likely to experience a level of natural inundation, although more substantial flooding currently occurs as a result of poorly designed road infrastructure within the southern end of the application area (Botanica, 2014). Saracen (2014b) have advised that any water runoff from cleared areas will be diverted and redirected into natural drainage systems to avoid ponding.

The application area is located within the Raeside-Ponton and Lake Carey catchment areas (GIS Database). However, given the size of the area to be cleared (500 hectares) in relation to the size of the catchment areas

(11,589,532 hectares and 11,378,213 hectares respectively) and the management measures proposed by Saracen, the proposed clearing is not likely to increase the potential for flooding in this region (GIS Database).

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

Methodology BoM (2014)
Botanica (2014)
Saracen (2014a)
Saracen (2014b)
GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There are no native title claims over the application area (GIS Database). The 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 24 registered Sites of Aboriginal Significance located in the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the Aboriginal Heritage Act 1972 and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

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

The clearing permit application was advertised on 15 September 2014 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Registered with the NNTT
- Native Title Claims - Filed at the Federal Court

4. References

Bamford (2001) Vertebrate Fauna of the Wildara (Thunderbox) Project Area. Consultants report prepared by Bamford Consulting Ecologists for Keith Lindbeck and Associates.

Biota (2006) Preliminary Summary of the Bannockburn Fauna Survey. Consultants report prepared by Biota Environmental Services for Jubilee Mines.

BoM (2014) Climate Statistics for Australian Locations. Climate Statistics for Australian Locations. A Search for Climate Statistics for Leinster, Australian Government Bureau of Meteorology, http://www.bom.gov.au/climate/averages/tables/cw_012314.shtml, viewed September 2014.

Botanica (2014) Level 1 Flora and Vegetation Survey of the Thunderbox to Bannockburn Project. Consultants report prepared by Botanica Consulting for Saracen Metals Pty Ltd.

DAFWA (2014) WAOL Download List. Department of Agriculture and Food. https://www.agric.wa.gov.au/organisms/export/-1 (Accessed September 2014).

DPaW (2014a) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. http://naturemap.dpaw.wa.gov.au/default.aspx (Accessed September 2014).

DPaW (2014b) Florabase profile for *Calytrix uncinata*. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/browse/profile/12373 (Accessed September 2014).

DEC (2011) Invasive Plant Prioritisation. Department of Environment and Conversation, Perth.

DEC (2012) Chuditch (*Dasyurus geoffroii*) National Recovery Plan, Wildlife Management Program No. 54, Department of Environment and Conservation, Perth.

Keighery, B.J (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Pavey, C (2006) National Recovery Plan for the Greater Bilby *Macrotis lagotis*. Northern Territory Department of Natural Resources, Environment and the Arts, Northern Territory.

Pringle, H.J.R., Van Vreeswyk, A.M.E and Gilligan, S.A (1994) An inventory and condition survey of rangelands in the north-eastern Goldfields, Western Australia. Department of Agriculture, South Perth.

Saracen (2014a) North Eastern Goldfields Operations Clearing Permit Application Supporting Information. Saracen Metals Pty Ltd.

Saracen (2014b) North Eastern Goldfields Operations Environmental Management Plan: Surface Water Management. Saracen Metals Pty Ltd.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (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	*Rights in Water and Irrigation Act 1914*, Western Australia
s.17	Section 17 of *the Environment Protection Act 1986*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T — **Threatened species:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by the Department according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:
CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.
EN: Endangered - considered to be facing a very high risk of extinction in the wild.
VU: Vulnerable - considered to be facing a high risk of extinction in the wild.

X — **Presumed Extinct species:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).

IA — **Migratory birds protected under an international agreement:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.
Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.

S — **Other specially protected fauna:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P1 — **Priority One - Poorly-known species:**
Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

P2 — **Priority Two - Poorly-known species:**
Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

P3 **Priority Three - Poorly-known species:**
Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities 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 localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

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 do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

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

P5 **Priority Five - Conservation Dependent species:**
Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.