



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4178/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Tiwest Pty Ltd

1.3. Property details

Property: Exploration Licence 70/2345
Exploration Licence 70/2346
Local Government Area: Shire of Dandaragan
Colloquial name: Cooljarloo West Exploration Drilling Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 7 April 2011

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. The following Beard vegetation association has been mapped within the application area (GIS Database):

1030: Low woodland; *Banksia attenuata* & *B. menziesii*.

Woodman Environmental Consulting Pty Ltd carried out structural plant community mapping of the Cooljarloo West area in November 2008. Mapping was undertaken using aerial photography, various Department of Environment and Conservation databases and data collected from numerous flora and vegetation surveys undertaken in the Cooljarloo West area between 2005 and 2008 (Woodman Environmental Consulting Pty Ltd, 2009a).

A total of 22 structural plant communities were described and mapped within the Cooljarloo West area, 11 of which occur in the area subject to this clearing permit application:

Heaths

H1 – Low Scrub to Heath dominated by *Melaleuca brevifolia* on brown sand over clay in drainage lines and basins;

H4 – Heath dominated by a mix of species including *Banksia telmatiaea*, *Regelia ciliata* and *Melaleuca seriata* with occasional Scrub or Open Scrub of *Hakea obliqua* subsp. *parviflora* on grey or brown sand on lower slopes, flats and drainage basins;

H5 – Heath dominated by *Allocasuarina humilis* and *Melaleuca seriata* with emergent *Eucalyptus todtiana* and *Nuytsia floribunda* on brown sand on midslopes;

H7 – Low Heath dominated by *Gastrolobium oxylobioides* and *Hakea* spp. on brown sand over laterite on midslopes and low rises;

Thickets

T1 – Scrub to Thicket dominated by *Melaleuca lateriflora* subsp. *acutifolia* on brown or grey clay or loamy clay in basins;

T3 - Scrub to Thicket dominated by *Acacia saligna*, *Viminaria juncea* and *Melaleuca raphiophylla* (stunted form) on grey or brown sand over clay on lower slopes, drainage lines and minor basins;

T4 – Scrub to Thicket dominated by *Melaleuca raphiophylla* and *Melaleuca viminea* subsp. *viminea* on brown or grey sand over clay in basins;

Woodlands

W1 – Low Woodland to Dense Low Forest of *Melaleuca raphiophylla* over Low Sedges on brown sand over clay in basins;

W3 – Low Woodland to Low Forest of *Banksia attenuata* and *Banksia menziesii* with occasional *Eucalyptus tottiana* over Heath dominated by *Eremaea pauciflora* and/or *Hibbertia hypericoides* on brown or grey sand on lower to midslopes;

W4 – Open Low Woodland of *Banksia attenuata*, *Banksia menziesii* and *Melaleuca preissiana* over Low Heath on brown sand in swales and low rises;

W7 – Open Low Woodland of *Banksia ilicifolia*, *Banksia menziesii* and *Banksia attenuata* over Heath on brown sand on lowerslopes;

In addition, Woodman Environmental Consulting Pty Ltd has undertaken Floristic Community Type (FCT) mapping in the Falcon area which includes proposed drill lines in the north-eastern portion of this clearing permit application. A total of 11 FCT's were mapped for the Falcon area, of which six occur in the proposed clearing area:

FCT1 – Heath dominated by *Banksia telmatiaea* and/or *Melaleuca viminea* subsp. *viminea* on grey or brown sandy clay in drainage lines and basins;

FCT 2 - Heath dominated by a mix of species including *Melaleuca brevifolia*, *M. raphiophylla* and *M. lateriflora* subsp. *acutifolia* interspersed with stands of *Viminaria juncea* on grey or brown sandy clay on lowerslopes, flats and basins;

FCT 4 - Scrub of *Viminaria juncea* over Heath of *Banksia telmatiaea* and *Regelia ciliata* on grey or brown sand in wet basins;

FCT 5 – Species rich Heath dominated by *Banksia telmatiaea* and various other species including *Beaufortia squarrosa*, *Kingia australis* and *Regelia ciliata* on brown or grey sand on lowerslopes, flats and depressions;

FCT 9a - Low Woodland of *Banksia attenuata*, *B. menziesii* and *Eucalyptus tottiana* with occasional *Banksia ilicifolia* over Heath on grey or white sand on mid to upperslopes; and

FCT 11 – Low Heath dominated by *Calothamnus sanguineus*, *Hakea incrassata*, *H. lissocarpha* and *Hibbertia* spp. on grey or brown sandy clay with lateritic gravel on midslopes and swales (Woodman Environmental Consulting Pty Ltd, 2009a).

Clearing Description

Tiwest Pty Ltd has applied to clear up to 54 hectares of native vegetation within an application area of approximately 254 hectares to undertake Phase 3 of the Cooljarloo West Exploration Drilling Programme. Clearing will consist of 126.2 kilometres of new drill lines and access tracks at an approximate width of 2.6 metres. Additional clearing (up to 4 metres width) will be required at drilling locations and at the end of drill lines to allow for sufficient work and turning area (Tiwest Pty Ltd, 2011).

Aircore drilling will be undertaken along drill lines for the purpose of mineral sands exploration. Drill lines will typically be spaced 80 – 1,000 metres apart (Tiwest Pty Ltd, 2011).

Native vegetation clearing will consist of driving over vegetation with a Landcruiser and light Mitsubishi Canter type truck. In areas where vegetation is too dense to employ this clearing technique a rubber tyred front end loader will flatten vegetation using a raised bucket (Tiwest Pty Ltd, 2011).

Vegetation Condition

Pristine: No obvious signs of disturbance (Keighery, 1994).

to

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

Comment

The vegetation condition rating is derived from information provided by Woodman Environmental Consulting Pty Ltd (2009a), Mattiske Consulting (2010) and Tiwest Pty Ltd (2011).

Of the 54 hectares applied to clear, 25.2 hectares has been previously approved under clearing permits CPS 2638/1 and 3525/1. The areas from these permits along with the additional 28.8 hectares of new clearing will be amalgamated into one permit for ease of management and reporting. Clearing permits CPS 2638/1 and 3525/1 will be revoked after CPS 4178/1 is granted.

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 at variance to this Principle

The proposed clearing area is located approximately 20 kilometres south-east of Cervantes in the Swan Coastal Plain 2 subregion of the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Swan Coastal Plain 2 subregion is characterised by *Banksia* and *Tuart* on sandy soils, *Casuarina obesa* on outwash plains and paperbark in swampy areas. The subregion is a part of the South West Botanical Province, an area which has a very high degree of species diversity. The subregion is comprised of a complex series of seasonal wetlands, with more than 25% of the Swan Coastal Plain land area between Wedge Island and Dunsborough being wetland (CALM, 2002).

The Cooljarloo West area contains very high floristic diversity, with Woodman Environmental Consulting Pty Ltd recording 617 flora taxa (including 4 Declared Rare Flora taxa and 39 Priority Flora taxa) at Cooljarloo West between 2005 and 2008 (Woodman Environmental Consulting Pty Ltd, 2009a). A total of 22 plant communities were identified in the Cooljarloo West area through structural plant community mapping, 11 of which will be impacted to some degree by the proposed clearing. A number of the communities recorded during the surveys have been identified as being restricted communities (Tiwest Pty Ltd, 2011). Efforts have been made to avoid these communities, however, the restricted communities H7, T2, T3, W4 and FCT 1 do occur within the application area (Tiwest Pty Ltd, 2011). Clearing of these communities will be less than 0.15 hectares per community, so the clearing is not expected to cause significant impacts to these restricted communities.

There has been 39 species of Priority Flora recorded at the Cooljarloo West area (Woodman Environmental Consulting Pty Ltd, 2009a). Whilst a large number of Priority Flora taxa are known from Cooljarloo West, Woodman Environmental Consulting Pty Ltd (2009b) notes that the proposed clearing is likely to cause minimal impact to the local and regional distribution to the majority of these taxa given the large ranges, extensive habitats and populations located within secure tenure. The linear nature of the proposed clearing and the minimal disturbance to topsoil was also taken into consideration when assessing potential impacts of this clearing proposal.

On this basis, Tiwest Pty Ltd has adopted a risk-based approach to the management of Priority Flora during mineral exploration activities, commissioning flora surveys to focus only on the poorly known Priority Flora taxa with restricted distributions during the significant flora assessment. During a flora survey of the application area in September 2010, Mattiske Consulting (2010) recorded 13 species of Priority Flora. However, only one of the species; *Malleostemon* sp. ?Cooljarloo is on the list of targeted Priority Flora species (Tiwest Pty Ltd, 2011). It was found at the end of one drill line which has been shortened by 100 metres to avoid impact this species. Whilst Priority Flora will be impacted, none of the species identified under their risk assessment methodology are within the application area.

From a faunal perspective, 253 vertebrate fauna species (including 36 species of conservation significance) may occur in the Cooljarloo West area (Tiwest Pty Ltd, 2011). Field surveys of the Cooljarloo area have recorded three amphibians, ten reptiles, 21 birds and nine mammal species (Tiwest Pty Ltd, 2011). More than 20,000 hectares of uncleared native vegetation is present on Exploration Licences 70/2345 and 70/2346, and numerous conservation estates are located in close proximity to the proposed clearing area (GIS Database). It is considered unlikely that the linear areas applied to clear would support a higher level of faunal diversity than surrounding uncleared areas of native vegetation.

Given the high level of floristic diversity in the Cooljarloo West area (including an abundance of conservation significant flora) the proposed clearing is at variance to this Principle.

Methodology CALM (2002)
Mattiske Consulting (2010)
Tiwest Pty Ltd (2011)
Woodman Environmental Consulting Pty Ltd (2009a)
Woodman Environmental Consulting Pty Ltd (2009b)
GIS Database:
- DEC Tenure
- IBRA WA (Regions - Sub Regions)

(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

Fauna studies have been undertaken at the Cooljarloo mine site area since 1986, with a majority of work conducted by Bamford Consulting Ecologists. Terrestrial vertebrates and aquatic macro-invertebrates have been sampled using a variety of techniques such as bird censusing, mist netting, pitfall, funnel, Elliot and cage trapping (Tiwest Pty Ltd, 2011). Baseline surveys have confirmed that significant species are present on the Cooljarloo tenements (Tiwest Pty Ltd, 2011). It is inferred that the fauna assemblages of the Cooljarloo tenements would be the same as that of the Cooljarloo west tenements subject to this clearing permit application.

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Schedule 1; Endangered) are known within the Cooljarloo West area (Tiwest Pty Ltd, 2011). Parts of the application area are suitable feeding habitat for this species (Tiwest Pty Ltd, 2011). Whilst some feeding habitat will be impacted by the proposed clearing, it is a relatively small amount of the available feeding habitat in the local area. Large trees have been flagged to be avoided to further reduce the potential impacts on Carnaby's Black Cockatoos (Tiwest Pty Ltd, 2011).

The Cooljarloo West Exploration Drilling Programme will involve low impact, non-contiguous clearing of 54 hectares of native vegetation. Localised impacts to fauna species would be expected to be of a minor nature and may include:

- direct mortality of fauna during vegetation clearing or vehicle strike;
- temporary loss of habitat for foraging, shelter and/or nesting;

- localised displacement;
- increased competition for resources in adjacent habitat;
- increased access for feral animals along cleared drill lines and access tracks; and
- noise pollution.

Vehicles travelling along drill lines will be slow moving, thereby reducing the potential for animal deaths. Vehicles travelling on existing access tracks will be moving slightly faster, however the risk of fauna mortality from vehicle strike is still considered low (Tiwest Pty Ltd, 2011). In accordance with the Exploration Environmental Management Plan, low impact vegetation flattening techniques will be employed and large trees and thick vegetation will be avoided wherever possible (Tiwest Pty Ltd, 2009). Impacts of the proposal on fauna habitat are therefore unlikely to be significant.

Flattening of vegetation in corridors which will be 2.6 metres wide (with the exception of drilling locations and the end of drill lines which will be approximately 4 metres in width) is unlikely to result in a loss of significant habitat for any fauna species indigenous to Western Australia.

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

Methodology Tiwest Pty Ltd (2009)
Tiwest Pty Ltd (2011)

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

Comments Proposal is at variance to this Principle

Numerous flora surveys have been undertaken over the Cooljaroo West area with the most recent being undertaken by Matiske Consulting in September 2010. There is the potential for eight species of Declared Rare Flora (DRF) to occur within the Cooljaroo West area (Matiske Consulting, 2010). There has been four species of DRF identified in the general Cooljaroo West area (Matiske Consulting, 2010; Tiwest Pty Ltd, 2011):

- *Andersonia gracilis*;
- *Anigozanthos viridis* subsp. *terraspectans*;
- *Macarthuria keigheryi*; and
- *Ptychosema pusillum*.

Ptychosema pusillum has not been recorded within or adjacent to any of the proposed drill lines and is not likely to be impacted by the proposed clearing (Matiske Consulting, 2010). The other three species have been recorded within or adjacent to proposed drill lines (Tiwest Pty Ltd, 2011).

In accordance with Tiwest Pty Ltd's (2009) Exploration Environmental Management Plan, all recorded location of DRF has been flagged for avoidance. However, an application to take DRF will be lodged in accordance with section 23F of the *Wildlife Conservation Act 1950* in the event that there are unavoidable impacts to DRF. The Species and Communities Branch of the Department of Environment and Conservation assesses applications to take DRF, with the final decision being made by the Minister for the Environment.

Permits to take have been previously granted for the removal of *Andersonia gracilis*, *Anigozanthos viridis* subsp. *terraspectans* and *Macarthuria keigheryi*. However, a permit to take will not be required for the 2011/12 drilling program as the drill lines and tracks have been deviated to avoid disturbance to these species (Tiwest Pty Ltd, 2011).

Whilst this current application may not result in the removal of any DRF, it will result in the clearing of vegetation that is habitat for DRF. Given this, the proposed clearing is at variance to this Principle. However, the proposed clearing has been designed to have a minimum disturbance to DRF and its habitat.

Methodology Matiske Consulting (2010)
Tiwest Pty Ltd (2009)
Tiwest Pty Ltd (2011)

(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). None of the structural plant communities or floristic community types that occur in the Cooljaroo West and Falcon areas have been identified as being a TEC (Matiske Consulting, 2011).

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

Methodology Matiske Consulting (2011)
GIS Database:
- Threatened Ecological Sites Buffered

(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 area applied to clear is within the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). According to Shepherd (2009) there is approximately 38.1% of the pre-European vegetation remaining in the Swan Coastal Plain bioregion. At the subregional level, there is approximately 41.2% of the pre-European vegetation remaining in the Perth subregion.

The vegetation of the proposed clearing area has been mapped as (GIS Database):

Beard Vegetation Association 1030: Low woodland; *Banksia attenuata* & *B. menziesii*.

There is approximately 71.7% of the pre-European vegetation remaining of Beard Vegetation Association 1030 in the Swan Coastal Plain subregion (see table) (Shepherd, 2009). The area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 1030 below current recognised threshold levels, below which species loss increases significantly.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Swan Coastal Plain	1,501,208***	583,140***	~38.8	Depleted	10.5 (24.2)
IBRA subregion – Swan Coastal Plain	1,117,743***	460,645***	~42	Depleted	11.6 (24.2)
Shire of Dandaragan	670,535***	299,219***	~44.6	Depleted	17.87 (37.5)
Beard veg assoc. – State					
1030	139,013	91,250	~65.6	Least concern	9.8 (14.6)
Beard veg assoc. – Bioregion					
1030	134,788	88,168	~64.4	Least concern	8.54 (12.7)
Beard veg assoc. – Subregion					
1030	114,215	81,855	~71.7	Least concern	9.8 (13.4)

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

*** Area within the Intensive Landuse Zone

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- 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

The proposed clearing area includes a number of small swamps, areas subject to inundation and minor non-perennial watercourses (GIS Database). Named wetlands such as Frederick Smith Creek, Cooljarloo Swamp and Coonmadodo Swamp are not subject to this clearing permit application (GIS Database).

Seminiuk (1994) (cited in Woodman Environmental Consulting Pty Ltd, 2006) undertook an ecological assessment and evaluation of system 5 wetlands, including the proposed clearing area and surrounds. The proposed clearing area is a part of the Mullering Wetlands chain, forming part of the Minyulo Suite; consisting of microscale sumplands, damplands and creeks. Water ranges from fresh to hypersaline and is maintained in wetlands through ponding and groundwater rise (Seminiuk, 1994; cited in Woodman Environmental Consulting Pty Ltd, 2006). Vegetation throughout forms complete cover or is a mosaic with open water. The Minyulo Suite consists of diverse habitats, serving a number of important ecological functions such as the provision of habitat for conservation significant flora, sediment transportation, acting as a pathway and habitat for fauna and acting

with a flushing mechanism to basin wetlands, floodplains/palusplains (Seminiuk, 1994; cited in Woodman Environmental Consulting Pty Ltd, 2006).

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

Impacts to native vegetation growing in association with watercourses and wetlands will be minimised as far as practicable by avoiding drainage areas wherever possible, employing low impact clearing techniques and adhering to weed and dieback protocols as outlined in the Exploration Environmental Management Plan and weed and dieback risk assessment (Tiwest Pty Ltd, 2009; Woodman Environmental Consulting Pty Ltd, 2009c).

Methodology Tiwest Pty Ltd (2009)
Woodman Environmental Consulting Pty Ltd (2006)
Woodman Environmental Consulting Pty Ltd (2009c)
GIS Database:
- Hydrography, lakes (course scale)
- Hydrography, lakes (medium scale)
- Hydrography, linear
- Natmap 250K Series Mapping

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

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

The proposed clearing area is located on the Swan Coastal Plain and occurs within the Bassendean Land System. This land system is characterised by a series of low vegetated dunes with interdunal seasonal wetlands and swamps. Soils are typically yellow to grey quartz sands (Tiwest Pty Ltd, 2011).

Tiwest Pty Ltd (2009) will implement low impact vegetation clearing techniques to minimise the potential for land degradation. For example, vegetation will be driven over or flattened using a rubber tyred front end loader using a raised bucket, as opposed to blade-down clearing. This technique will leave vegetation in situ, thereby preserving rootstock and minimising disturbance to topsoil. Wheel rutting and the creation of preferential flow paths for surface water run-off will also be reduced, minimising the potential for soil erosion. Other management strategies to be implemented during the proposed vegetation clearing include (Tiwest Pty Ltd, 2009):

- all vehicle movements will be restricted to defined tracks and survey lines;
- all vehicles will engage four wheel drive mode to minimise the potential for wheel rutting;
- all vehicles used during the proposed clearing and exploration drilling are relatively light, thereby reducing the potential for soil compaction; and
- large trees and thick vegetation will be avoided where possible.

Provided that the management strategies as outlined above are implemented, the proposed clearing is unlikely to cause appreciable land degradation.

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

Methodology Tiwest Pty Ltd (2009)
Tiwest Pty Ltd (2011)

(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 may be at variance to this Principle

None of the proposed clearing is within Western Australia's conservation estate, however it is located in close proximity to a number of conservation reserves, namely (GIS Database):

- An un-named 'A Class' Nature Reserve (located approximately 4 metres from the nearest proposed drill line);
- The 'C Class' Wongonderrah Nature Reserve (located approximately 2.6 kilometres north-east of the nearest proposed drill line);
- The 'C Class' Wanagarren Nature Reserve (located approximately 8 kilometres southwest of the nearest proposed drill line);
- Nambung National Park (located approximately 6.5 kilometres west of the nearest proposed drill line);
- An un-named Conservation Park (located approximately 5 kilometres northeast of the nearest proposed drill line); and
- Badgingarra National Park (located approximately 9.5 kilometres to the northeast).

The proposed vegetation clearing has the potential to impact on the environmental values of adjacent and nearby conservation areas through weed and dieback invasion, especially at a distance of 4 metres from the nearest Nature Reserve. Other conservation reserves located several kilometres from the proposed clearing are far less likely to be impacted.

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

Woodman Environmental Consulting Pty Ltd (2009b) undertook a weed and dieback risk assessment on behalf of Tiwest Pty Ltd to produce a hygiene risk map for the Cooljarloo West area, to identify high-risk activities associated with the proposed clearing and exploration and to propose a number of strategies to manage the risks. Provided that the risk assessment recommendations are strictly adhered to, the risk of spreading weeds and dieback into adjacent and nearby conservation areas is considered manageable. Impacts from weeds and dieback may be minimised by the implementation of weed and dieback conditions.

Methodology Woodman Environmental Consulting Pty Ltd (2009b)
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 is not likely to be at variance to this Principle

The proposed clearing area includes winter wet depressions, swamps, damplands and ephemeral creeklines (GIS Database; Tiwest Pty Ltd, 2011). There is a limited potential for surface water quality to be impacted by vegetation clearing given the low impact clearing techniques which will be employed. Vegetation will be flattened by a raised bucket (minimum 200 millimetres off the ground) of a rubber tyred front end loader. Rootstock and topsoil will remain intact (Tiwest Pty Ltd, 2011). Surface water run-off from cleared areas is therefore unlikely to result in sedimentation or turbidity of surface water features on site or off site.

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database). The groundwater of the local area consists of a superficial aquifer (three to fifteen metres below surface, to a depth typically less than 50 metres) which is charged by winter rains (Tiwest Pty Ltd, 2009). Apart from some hand clearing at drilling locations, low impact clearing techniques will be employed which include driving over vegetation and flattening vegetation with a raised bucket of a front end loader. No significant impacts to groundwater are expected as a result of clearing.

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

Methodology Tiwest Pty Ltd (2009)
Tiwest Pty Ltd (2011)
GIS Database:
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

(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

The proposed clearing area consists of seasonally wet depressions and creeklines which form part of the Mullering Wetlands chain (Woodman Environmental Consulting Pty Ltd, 2006). The proposed clearing area is located in the Nambung River catchment, an area of approximately 295,000 hectares (GIS Database). The scale and nature of the proposed clearing render the proposal unlikely to exacerbate the incidence or intensity of natural flood events.

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

Methodology Woodman Environmental Consulting Pty Ltd (2006)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

There is one native title claim over the area under application (GIS Database). This claim (WC97/071) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). 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*.

According to available databases, there are no registered Aboriginal Sites of Significance within the proposed clearing area (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.

Part of the current application area covers the Phase 1 Cooljarloo West Exploration Drilling Programme. On 15 October 2008, the then Department of Industry and Resources (DoIR) referred Phase 1 of the Cooljarloo West Exploration Drilling Programme to the Environmental Protection Authority (EPA) under section 38 of the

Environmental Protection Act 1986. On 17 November 2008, the EPA advertised its level of assessment on Phase 1 of the Cooljarloo West Exploration Drilling Programme as 'Not Assessed - Managed under Part V of the EP Act (Clearing)'. Whilst the proposal raised a number of environmental issues, the EPA did not consider the overall environmental impact of the proposal to be significant enough to warrant formal assessment and the subsequent setting of conditions by the Minister for the Environment. On this basis, the current application was not referred to the EPA.

It is noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) for environmental impact assessment under the *EPBC Act*. The proponent is advised to contact the SEWPAC for further information regarding notification and referral responsibilities under the *EPBC Act*.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation 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 was advertised on 7 February 2011 by the Department of Mines and Petroleum inviting submissions from the public. There was one submission received stating no objections to the proposal.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title - Registered with the NNTT

4. References

- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske Consulting (2010) Flora and Vegetation Survey of Exploration Access and Drill Lines in Cooljarloo West and Cooljarloo North West. Unpublished report for Tiwest Pty Ltd dated December 2010.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Tiwest Pty Ltd (2009) Exploration Environmental Management Plan - Cooljarloo West Tenements (E70/2345, E70/2346, E70/2490, E70/2491). 26 February 2009.
- Tiwest Pty Ltd (2011) Cooljarloo West Exploration Drilling. Supporting information for clearing permit application dated January 2011.
- Woodman Environmental Consulting Pty Ltd (2006) Empire Oil & Gas NL - Mullering Onshore 3D Seismic Survey. Flora, Vegetation and *Phytophthora cinnamomi* Assessment. December 2006.
- Woodman Environmental Consulting Pty Ltd (2009a) Cooljarloo West Project: Flora and Vegetation Assessment. Unpublished report for Tiwest Pty Ltd dated September 2009.
- Woodman Environmental Consulting Pty Ltd (2009b) Cooljarloo West Drilling Program 2010: Significant Flora Assessment. Unpublished report for Tiwest Pty Ltd dated December 2009.
- Woodman Environmental Consulting Pty Ltd (2009c) Exploration drilling risk assessment - Cooljarloo West. *Phytophthora cinnamomi* and weed hygiene risk. Unpublished report for Tiwest Pty Ltd dated May 2009.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
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
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:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.