



1. Application details

1.1. Permit application details

Permit application No.: 874/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Nickel West

1.3. Property details

Property: M69/72
M69/73
M69/75
E69/1155
E69/1156
Local Government Area: Shire Of Ngaanyatjaraku
Colloquial name: West Musgrave Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation association 19: Low woodland: mulga between sand ridges (Hopkins et al., 2001; Shepherd et al., 2001)	The proposed clearing of 4 hectares will involve line clearing and drilling a total of 20 diamond drill holes, with associated drill pads and sumps (BHP Billiton Nickel West, 2005). A flora and vegetation survey of the application area was undertaken between the 6 and 7 August 2005 (Western Botanical, 2005). The following six habitat types were identified: * Dune Shrubland - occurs on low linear parallel dunes comprising red aeolian sand, oriented in a NW-SE direction. Vegetation consists of low to medium shrubs including <i>Grevillea stenobotrya</i> , <i>Gyrostemon ramulosus</i> , <i>Aluta masonneuvei</i> , <i>Eremophila wilsii</i> ssp. <i>integrifolia</i> and <i>Dicrastyliis</i> sp. * Low Dune Mallee Shrubland - an extension of Dune Shrubland, with a substantial mallee component (<i>Eucalyptus gamophylla</i>). The dunes have a low profile with a deep, red aeolian sand sheet and may include a shallow perched calcrete stratum. Common shrubs and grasses include <i>Acacia ligulata</i> , <i>A pachyacra</i> , <i>Eremophila platythamnos</i> ssp. <i>exotrachys</i> and <i>Triodia basedowii</i> . * Sand Sheet Spinifex Grasslands - shallow red silty sand sheets support extensive <i>Triodia basedowii</i> and/or <i>Triodia schinzii</i> hummocked grasslands with an occasional shrub and tree stratum. * Wanderrrie Grassland - shallow sandy soils over hardpan support a Wanderrrie Grass (<i>Eriachne helmsii</i> and <i>Eragrostis eriopoda</i>) dominated lower stratum, largely excluding <i>Triodia</i> spp, and lacking substantial shrubs and trees.	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate to Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)	The flora and vegetation survey of the Babel, Nebo and East Chamber Prospects was undertaken by Western Botanical over two days (6 and 7 August) in 2005. The vegetation habitats were identified by conducting traverses of the Babel and Nebo prospects. Of the twenty drill sites comprised in this application, 12 are within the south western portion of the Babel prospect, and 8 are within the East Chamber Prospect. All drill sites identified in the current application are within the habitats identified during the flora and vegetation survey. The majority of the sites are situated within Calcrete Platform Shrublands, Sand Sheet Spinifex Grasslands and Dune Shrublands. The condition of the vegetation within the Babel, Nebo and East Chamber Prospects is generally good to excellent (Western Botanical, 2005). However, the prospects and the surrounding areas have been subject to relatively recent and frequent fire mosaics. Evidence of very recent fire (burnt vegetation, absence of grasses and ground cover) is apparent at various sites in the region traversed. Little evidence of grazing was noted and no significant soil erosion issues were identified.

* Mulga-Wanderrie Woodlands - hardpan red clay loams support groved Mulga (*Acacia aneura*) woodlands with a substantial grass component. *Triodia* spp are absent.

* Calcrete Platform Shrublands - low calcrete rises support scattered shrubs and Spinifex. Grasses include *Triodia basedowii*, *Enneapogon avenaceus*, *Eragrostis eriopoda* and *Themeda triandra*. Shrubs include *Petalostylis cassioides*, *Hibiscus arenicola*, *Kennedia prorepens*. Larger Shrubs and trees such as *Acacia kempeana*, *A victoriae* and *Eucalyptus gamophylla* are occasional.

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 habitats which were identified and described for the drill sites are well represented outside the prospects and are representative of that commonly noted in the broader region east of Warburton (Western Botanical, 2005). They are also well represented in the remainder of Aboriginal Reserve 17614 (BHP Billiton Nickel West, 2005).

No Threatened Ecological Communities or Declared Rare Flora were identified within the application area (Western Botanical, 2005). The Priority 3 plant, *Microcorys macradeniae* was identified within the prospects, but not at the drill sites. Conditions will be imposed on the clearing permit to prevent clearing of this species.

Methodology BHP Billiton Nickel West, 2005
Western Botanical, 2005

(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**

Current fauna survey data is not available for this region (BHP Billiton Nickel West, 2005). However, as the habitats identified and described for the drill sites are well represented outside the prospects and are representative of that commonly noted in the broader region east of Warburton (Western Botanical, 2005), the clearing of 4 hectares of this vegetation does not constitute a significant habitat for fauna. Therefore, the proposal is not likely to be at variance to this principle.

Methodology BHP Billiton Nickel West, 2005
Western Botanical, 2005

(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**

The flora and vegetation survey of the Babel, Nebo and East Chamber Prospects undertaken by Western Botanical on 6 and 7 August 2005 included detailed site assessments over the twenty proposed exploration drilling locations in this application (Western Botanical, 2005). The survey included determination of vegetation habitats on the Babel and Nebo Prospects, as well as recording of populations of significant taxa within and outside the prospects.

No Declared Rare, Priority or geographically restricted species were identified within the 20 proposed drill sites assessed (Western Botanical, 2005).

While no species of conservation significance were recorded within any of the drill sites, a large population of *Microcorys macradeniae* (P3) occurs within the East Chamber prospect between drill holes 15 and 16 (Western Botanical, 2005). This population occurs at the northern end of a low sand dune and can be readily avoided in the future. It is recommended that this population and its supporting low Dune Shrubland habitat be given a relatively wide berth when establishing access to the drilling sites within the tenement. With respect to management of this population, BHP Billiton Nickel West state that new tracks and drill pads will be located to avoid disturbance to this species (2005). The Project Manager for the drilling program accompanied Western Botanical during the flora survey and is consequently able to identify the species in the field, so as to ensure the drilling activity disturbance avoids this species.

CALM is supportive of BHP Billiton Nickel West's commitment to avoid the known priority flora *Microcorys macradeniae* (CALM, 2005).

Methodology Western Botanical, 2005
BHP Billiton Nickel West, 2005
CALM, 2005

GIS Databases:
Declared Rare and Priority Flora List - CALM 01/07/05

(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

There are no known TECs in the vicinity of the application area (Threatened Ecological Communities - CALM 12/04/05). Therefore this proposal is unlikely to be at variance to this Principle.

Methodology GIS Databases:
Threatened Ecological Communities - CALM 12/04/05

(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

Aboriginal Reserve 17614 has not been extensively cleared and the vegetation to be disturbed is well represented locally (BHP Billiton Nickel West, 2005). Habitats which have been identified and described for the drill sites are well represented outside the prospects and are representative of that commonly noted in the broader region east of Warburton (Western Botanical, 2005). Furthermore, vegetation association 19 mapped by Beard has over 99% of the Pre-European extent remaining (Shepherd et al., 2001). This association is therefore of 'least concern' for biodiversity conservation.

	Pre-European area (ha)	Current extent (ha)	Remaining %*	Conservation Status**	% in IUCN Class I-IV reserves
IBRA Bioregion - Central Ranges					
	5,132,641*	5,132,641*	100%	Least concern	
Shire of Ngaanyatjarraku	No information available				
Beard vegetation association - 19	4,888,643	4,885,387	99.9%	Least concern	0.5%

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

Methodology BHP Billiton Nickel West, 2005
Western Botanical, 2005
Shepherd et al., 2001
Department of Natural Resources and Environment, 2002
Hopkins et al., 2001

GIS databases:
Pre-European Vegetation - DA 01/01
Interim Biogeographic Regionalisation of Australia - EA 18/10/00

(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 not likely to be at variance to this Principle

No watercourses or wetlands are located within the proposed disturbance area (BHP Billiton Nickel West, 2005; Cockerton, 2005). Small well defined depressions in the landscape may support claypan grass (*Eriachne* sp), but none of these are near the proposed drilling sites (Cockerton, 2005).

With regard to riparian vegetation, none of the flora taxa listed at the drill locations, or observed in the application area during the flora survey in early August 2005 (Western Botanical, 2005) is distinctive of watercourses or wetlands, so is not defined as riparian vegetation.

Methodology BHP Billiton Nickel West, 2005
Western Botanical, 2005
Geoff Cockerton, Environmental Consultant, Western Botanical (pers comm, 02/12/05) ref: 438.KF

(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

Given that land disturbance will be limited to a series of small drill pads and sumps and connecting tracks which will be rehabilitated within six months of the drilling program's completion (including replacement of

topsoil where available), it is unlikely that the vegetation clearance will result in land degradation (BHP Billiton Nickel West, 2005).

With regard to soil erosion subsequent to the clearing of vegetation, the average annual rainfall is 200 to 250 mm (BHP Billiton Nickel West, 2005) and usually sporadic. Rainfall in single events can be high (BoM, 2005), but as the landscape has a low relief (Western Botanical, 2005), with sand dunes and calcrete rises constituting the raised areas, the potential for erosion is very low and the soils in the more undulating areas are sandy in the majority, so there is a high potential for infiltration as opposed to generation of runoff, and subsequently, erosion. Surface sheeting is likely only in the hardpan areas (Cockerton, 2005).

Methodology BHP Billiton Nickel West, 2005
BoM, 2005
Western Botanical, 2005
Geoff Cockerton, Environmental Consultant, Western Botanical (pers comm, 02/12/05) ref: 438.KF

(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 area for proposed clearing is not within a conservation area (GIS database: CALM Managed Lands and Waters - CALM 1/07/05) or proposed conservation area recognised by CALM (DoIR, 2005). However, it is within an area of the 'Ranges of the Western Desert', which is listed on the Register for National Estate (BHP Billiton Nickel West, 2005) for its unique aboriginal heritage, landscape and endemic flora values (DEH, 2005). This area is also recognised as Red Book Area 12.19, Ranges of the Western Desert (Conservation through Reserves Committee, 1974) for these same reasons.

The proposed disturbance is small in comparison to the total area listed within the Ranges of the Western Desert. Furthermore, the applicant has an agreement with the Ngaanyatjarra Land Council to gain access to Aboriginal Reserve 17614 for the purposes of mineral exploration and mining (BHP Billiton Nickel West, 2005). The flora survey conducted in August 2005 found that there are no endemic species within the areas proposed to be cleared (Western Botanical, 2005), and the applicant has committed to avoid the P3 species *Microcorys macraedeniae* (BHP Billiton Nickel West, 2005). As such, the impacts of the proposed clearing of 4 ha of vegetation are not likely to compromise the values of the Ranges of the Western Desert.

CALM concurs with the conclusions that this proposal is unlikely to have a significant impact on the values of the Ranges of the Western Desert area (CALM, 2005)

Methodology DoIR, 2005
DEH, 2005
Conservation through Reserves Committee, 1974
BHP Billiton Nickel West, 2005
CALM, 2005
Western Botanical, 2005

GIS databases:
CALM Managed Lands and Waters - CALM 1/07/05
Register of National Estate - EA 28/01/03
System 1 to 5 and 7 to 12 Areas - DEP 06/95

(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 at variance to this Principle

No watercourses or wetlands are located within the proposed disturbance area (BHP Billiton Nickel West, 2005; Cockerton, 2005). With regard to degradation of water quality from soil erosion subsequent to the clearing of vegetation, the average annual rainfall is 200 to 250 mm (BHP Billiton Nickel West, 2005) and usually sporadic. Rainfall in single events can be high (BoM, 2005), but as the landscape has a low relief (Western Botanical, 2005), with sand dunes and calcrete rises constituting the raised areas, the potential for erosion is very low and the soils in the more undulating areas are sandy in the majority, so there is a high potential for infiltration as opposed to generation of runoff, and subsequently, erosion and deposition. Surface sheeting is likely only in the hardpan areas (Cockerton, 2005).

Groundwater quality is good (sub-potable to potable), and the presence of Mallee shrubland calcrete habitat within the survey area, is indicative of shallow groundwater aquifers (BHP Billiton Nickel West, 2005). Given the high rates of evaporation (3,400 mm/annum) compared to the average annual rainfall (200-250mm), runoff does not represent a major source of groundwater aquifer recharge. The area to be cleared is small (4 ha) and dispersed, and therefore the clearing will not result in degradation of the groundwater.

Methodology BHP Billiton Nickel West, 2005
Western Botanical, 2005

(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 at variance to this Principle**

The dispersed nature of the clearing activities and its small size (4ha) relative to the extensive uncleared surrounding lands infer that the clearing will not cause or exacerbate flooding.

Methodology GIS databases:

Western Australia ETM 25m 543 - AGO 04

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.**Comments**

The exploration activities will take place entirely within Aboriginal Reserve 17614. BHP Billiton Nickel West has a current entry permit granted by the then Minister for Indigenous Affairs under section 31 of the *Aboriginal Affairs Planning Authority Act 1972* (BHP Billiton Nickel West, 2005).

There is a native title claim over the area under application; WC04/003. This claim has been registered with the National Native Title Tribunal on behalf of the Ngaanyatjarra Lands claimant group. However, the mining tenements have been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (ie. 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 is no current Operating Licence or Works Approval for this property, granted under the *Environmental Protection Act 1986* (DoE, 2005). There is no current groundwater licence for this property, granted in accordance with the *Rights in Water and Irrigation Act 1914*.

CALM recommends that further flora surveys to determine the extent of the priority flora (*Microcorys macradeniae*) should be encouraged (CALM, 2005). This additional information would assist in the assessment of the level of impact on the flora should the proponent need to take any of the priority species during future activities.

Note that clearing must not commence until all other environmental approvals have been obtained. This may include approvals under other acts, such as the *Mining Act 1978* or various Petroleum Acts.

Methodology

BHP Billiton Nickel West, 2005

DoE, 2005

CALM, 2005

GIS Databases:

Native Title Claims - DLI 19/12/04

4. Assessor's recommendations

Purpose	Method	Applied area (ha)	Decision	Comment / recommendation
Mineral Exploration	Mechanical Removal	4	Grant	It is recommended that this permit be granted.

The proposed clearing of 4 hectares will involve line clearing and drilling a total of 20 diamond drill holes, with associated drill pads and sumps.

The following conditions apply to the permit:

1. The Permit Holder must not clear within 20 m of the boundaries of the Priority 3 flora population of *Macrocoorys macradeniae*, as indicated by the area cross hatched red on attached Plan 874/1.

2. For each instance of clearing done under this permit, the Permit Holder must record:

- the co-ordinates of areas cleared using Geocentric Datum Australia 1994;
- the size of the areas cleared in hectares; and
- the dates on which the area was cleared.

3. For each instance of clearing recorded under condition 2, the Permit Holder must, within

6 months of the completion of exploration activities, rehabilitate all cleared areas by re-shaping the surface so that it is consistent with the surrounding 5 metres of uncleared land, and re-spreading the topsoil and vegetative material over each cleared area.

4. For each area rehabilitated under condition 3 of this permit, the Permit Holder must record:
 - a) the co-ordinates of areas rehabilitated using Geocentric Datum Australia 1994;
 - b) the size of the areas rehabilitated in hectares; and
 - c) the dates on which the area was rehabilitated.
5. The Permit Holder shall provide a report to the Director, Environment, DoIR by 1 February each year, setting out the records required under conditions 2 and 4 of this permit in relation to clearing carried out between 1 January and 31 December of the previous year.

5. References

- BHP Billiton Nickel West (2005). *Letter attachment to Application for a Clearing Permit (purpose permit)*. GPS 874/1. BHP Billiton Nickel West, Perth.
- BoM (2005). *Climate averages for Warburton Airfield*. Last updated 16 August 2004. Bureau of Meteorology, viewed 1 December 2005, [http://www.bom.gov.au/climate/averages/tables/cw_013011.shtml]
- CALM advice: CALM (2005). *Draft assessment report for CALM review and comment - BHP Billiton Nickel West, West Musgrave Project*. CALM Advice. Department of Conservation and Land Management, Western Australia. DOI ref 437.KF
- Conservation through Reserves Committee (1974). *Conservation Reserves in Western Australia: Report of the Conservation through Reserves Committee to the Environmental Protection Authority 1974, Section 2 - Systems 8-12*. Conservation through Reserves Committee, Perth.
- DEH (2005). *Australian Heritage Database: Place Details - Ranges of the Western Desert - Warburton Rd, Warburton via Laverton, WA*. DEH, Canberra. Report prepared 29 November 2005. [<http://www.deh.gov.au/cgi-bin/ahdb/search.pl>]
- 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.
- DoE Advice: DOE (2005). *Operating Licence, Groundwater Licence and Works Approvals Checks*. Department of Environment, Kalgoorlie.
- DoIR (2005). *Tengraph*. Publicly available land information mapping system. Viewed 011205. DoIR, Perth.
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) *A database on the vegetation of Western Australia. Stage 1*. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.
- Keighery, BJ (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Western Botanical (2005). *Flora and Vegetation of the Babel, Nebo and East Chamber Prospects*. West Musgrave, Western Australia. August 2005. Western Botanical, Mundaring. Report ref WB315.

6. Glossary

Term	Meaning
BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
EA	Environment Australia, Canberra (see DEH).
GIS	Geographical Information System.
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	Rights in Water and Irrigation Act 1914, Western Australia.
TECs	Threatened Ecological Communities.

7. 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* :-

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.

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.