



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2965/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Yeelirrie Development Company Pty Ltd

1.3. Property details

Property: Uranium (Yeelirrie) Agreement Act 1978, Mineral Claims 53/1098, 53/1099, 53/1100, 53/1101, 53/1102, 53/1103, 53/1104, 53/1105, 53/1106, 53/1122, 53/4126, 53/4127, 53/4805 53/5320
Local Government Area: Shire of Wiluna
Colloquial name: Yeelirrie Uranium Project Phase 2

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
55		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 Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard Vegetation Associations are located within the application area (GIS Database):

18: Low woodland; Mulga (*Acacia aneura*); and

389: Succulent steppe with open low woodland; Mulga over saltbush.

Western Botanical (2009a) undertook a significant flora assessment of the proposed Phase 2 resource confirmation drilling programme between 14 and 16 March 2009. BHP Billiton Yeelirrie Development Company Pty Ltd (hereafter referred to as BHP Billiton) has made changes to the proposed Phase 2 drilling programme since this survey, hence the significant flora assessment included areas both within and outside of the area covered by this clearing permit application. The Assessing Officer, DMP, estimates that Western Botanical's significant flora assessment covered approximately 60% of the proposed clearing area. The remaining area was surveyed in December 2008 by Western Botanical as part of the Phase 1 Flora and Vegetation assessment.

For the significant flora assessment, a 50 metre wide corridor centred on each proposed drill line provided by BHP Billiton was surveyed in vehicle and on foot, searching for significant flora species. No vegetation communities were assessed during this survey, as these were previously described during a flora and vegetation assessment undertaken in December 2008 for the Phase 1 resource definition drilling programme (Western Botanical, 2009a).

A total of 20 vegetation communities were recorded adjacent to the proposed clearing area during a flora and vegetation survey undertaken by Western Botanical (2009b) between 9 and 11 December 2008. It is expected that the vegetation communities of the proposed clearing area would mirror these communities (Western Botanical, 2009a):

1. Sandplain Spinifex *Acacia prainii* Shrubland with Mallee (SASp-M) - *Acacia prainii* shrubland with *Triodia basedowii* hummock grasses to 0.4 metres, Plant Foliage Cover (PFC) 2-10% with emergent *Eucalyptus trivalvis* mallees 3-4 metres, PFC 10 - 15%;

2. Acacia-Eremophila shrubland on Calcrete (AESC) - *Acacia burkittii* 4 metres, *Senna artemisioides* ssp. *filifolia* 1.5 metres, occasional *Eremophila arachnoides* ssp. *arachnoides* (P3) 1.5 - 2.5 metres, *Acacia synchronicia* 1- 3 metres, PFC 10 -15%. Soil is a pale red-brown fine sand with calcrete below with discontinuous lag gravel 0.5 to 2 centimetres. Gently inclined (1 - 2%) to level sites forming a fringe around *Acacia burkittii* Shrubland on Calcrete (AbSC) from which it receives significant run-on. Also forms a mosaic with *Eucalyptus gypsophila* woodland (EgW) community. Both neighbouring communities could also support *Eremophila arachnoides* ssp. *arachnoides* (P3);

3. *Eucalyptus gypsophila* woodland (EgW) - Tall open woodland of *Eucalyptus gypsophila* ms 8-12 metres, PFC 30- 60%. Mid storey of occasional, scattered *Acacia burkittii* and *Templetonia ?egena* PFC 2 -5%. Approx 50% leaf litter and 50% bare ground. Soil is calcrete gravels with pale creamy coloured sand;

4. Sandplain Spinifex Mulga Shrubland (SAMU) - *Acacia aneura* 4-5 metres, PFC 15% over *Eremophila forrestii* ssp. *forrestii* 1.5 metres, *Acacia prainii* 1.5 metres, PFC 2 -5% over *Triodia basedowii* 0.3 metres, PFC 40-60%.

Long Unburnt;

5. Hard Pan Mulga Shrubland (HPMS) - *Acacia aneura* 4-5 metres, PFC 25- 40% with occasional *Grevillea berryana* 3-6 metres, *Acacia tetragonophylla* 3 metres, *Acacia ramulosa ssp. linophylla* 2 metres, PFC 5% over scattered *Eragrostis eriopoda* 0.3 metres, *Monachather paradoxus* 0.3 metres, occasional *Rhagodia drummondii* 0.7 metres at base of larger plants, *Ptilotus obovatus* (typical form), PFC 10%. Occasional occurrence of *Acacia sp. fragrant*;

6. Claypan (CPN) - Bare Claypan fringed by Halophytes including *Lycium australe* 1 metre, *Atriplex sp.* 0.8 metres. *Maireana pyramidata* and *Cratystylis subspinescens*;

7. *Melaleuca lanceolata* - *Lycium australe* Lake fringe Shrubland (MLaS) - Very scattered clumps of *Melaleuca lanceolata* 2.5 metres with scattered plants of *Lycium australe*, *Atriplex sp.* Low calcrete or gypsiferous dunes with cemented crust;

8. *Melaleuca interioris* Shrubland (MiS) - Patchy shrubland of *Melaleuca interioris* 2- 3 metres, *Eremophila longifolia* 3 metres, PFC to 70% over *Ptilotus obovatus* 0.4 metres, grasses, PFC 10% within clumps with mosaic of bare Claypan between patches;

9. *Acacia spp.*, *Ptilotus obovatus* shrubland (ApoS) - *Acacia aneura*, *Acacia ramulosa ssp. linophylla*, *Acacia burkittii* 2-3 metres, PFC 10% over *Ptilotus obovatus* (typical form) shrubland 0.4 metres, PFC 15-20% on red sand over hardpan;

10. *Eremophila longifolia* Grove (EIG) - Grove of *Eremophila longifolia* 4-5 metres, PFC 30% with emergent *Hakea lorea ssp. lorea* 8 -9 metres. Mid storey of *Acacia aneura*, *Acacia tetragonophylla*, to 4 metres, PFC 30% over *Ptilotus obovatus* (Typical form) 0.3 metres, PFC 15%. Internally drained site with run-on from adjacent MLS habitats;

11. *Melaleuca lanceolata* - *Ptilotus obovatus* Shrubland (MIPoS) - Very open shrubland of *Melaleuca lanceolata* 2.5 metres, occasional *Melaleuca interioris* 2.5 metres, PFC 5- 10% with scattered *Ptilotus obovatus* (Typical form) 0.4 metres, PFC 20%. Much bare ground, hardpan/ Claypan between clumps of shrubs;

12. *Melaleuca lanceolata* low Forest (MIFr) - Low forest of *Melaleuca lanceolata* to 8 metres, PFC 25-30%, trees Diameter at Breast Height (DBH) to 50 centimetres, with understorey of *Rhagodia drummondii* 0.8 metres, *Maireana spp.*, *Lycium australe* 1 metre, PFC 20%. On eastern margin of Claypan;

13. *Acacia burkittii* Shrubland on Calcrete (AbS) - Shrubland of *Acacia burkittii* 3 metres, PFC 10% with occasional emergent *E. gypsophila* 6-7 metres, no understorey;

14. *Atriplex sp.* Shrubland Plain (AtSP) - Shrubland of *Atriplex sp.* (domed shrub 0.6 metres), PFC 30% with occasional emergent *Lycium australe* 1.5 metres and *Melaleuca lanceolata* shrubs 3 metres, occasional trees to 6 metres, PFC < 5%. Soil is a red-brown cracking, self-mulching cyith calcrete gravel;

15. Gilgai - Low lying, drainage focus with heaving, cracking light brown clay soil with numerous sink holes. Vegetation of *Eragrostis setifolia*. Situated at the junction of Calcrete rise (AESC community) and PMS community;

16. *Casuarina pauper* Woodland (CpW) - Woodland of *Casuarina pauper* 6 -12 metres, PFC 10-25% with mid storey of *Acacia burkittii* 2 metres, *Senna artemisioides ssp. filifolia* 1.5 metres, may support *Eremophila arachnoides ssp. arachnoides* (P3) 2 metres, PFC 5-25%. Lowest stratum of *Ptilotus obovatus* (Typical form) 0.4 metres, PFC 10-20%;

17. *Atriplex sp.*, *Lycium australe* and *Cratystylis subspinescens* Shrubland (AtLaCsS) - Mid shrubland of *Lycium australe* 1.5 metres, *Cratystylis subspinescens* 1.5 metres PFC 10% over *Atriplex sp. #7* 0.5 metres, PFC 10%. Soil is a mosaic of red self mulching clay and creamy-red cracking clay with calcrete gravel. Occasional emergent *Melaleuca lanceolata* and *Eucalyptus gypsophila*;

18. *Eremophila longifolia* Groved Woodland - Gilgai Mosaic (EIGW-GM) - Mosaic of (i) clumps of *Eremophila longifolia* 6-7 metres with *Ptilotus obovatus* (understorey restricted to the tree canopy drip line) and (ii) Open grassy plains with *Eragrostis eriopoda* and large, deep Gilgai sink holes;

19. Hard Pan Grassy Plain (HPGP) - Level hard pan plain with small clumps of dead annual grasses and continuous cryptogamic crust. Occasional scattered *Grevillea berryana* 4-5 metres, *Senna artemisioides ssp. filifolia*, *Acacia burkittii* or clumps of *Melaleuca lanceolata* to 5 metres high, PFC < 5%;

20. *Cratystylis subspinescens* - *Maireana pyramidata* Shrubland (CsMpS) - Shrubland of *Cratystylis subspinescens* 1.5 metres, *Maireana pyramidata* 1 metre, PFC 30% on level red hard packed silty clay in depression. ?Underlying calcrete. Supports the taxonomically significant species *Scaevola spinescens* terete leaf form.

Clearing Description

BHP Billiton have applied for a Purpose Permit to clear up to 55 hectares of native vegetation within an application area of approximately 604 hectares. The proposed clearing will allow the proponent to undertake uranium exploration activities on mineral tenure overlying the Yeelirrie Pastoral Station, located some 110 kilometres north-

west of Leinster.

The proposed clearing will allow phase 2 of a multi-phase uranium exploration programme to be undertaken. It is proposed that phase 2 will consist of:

- 566 diamond drill holes (maximum 300 square metres of disturbance per drill pad - totalling 16.98 hectares);
- 126 aircore drill holes at 60 square metres of disturbance per drill hole – totalling 0.75 hectares);
- 75.8 kilometres of drill lines at 4 metres width (30.3 hectares); and
- 12 kilometres of access tracks at 4 metres width (4.8 hectares).

Approximate total area of disturbance is estimated at 52.8 hectares. A small surplus has been applied for to allow for changes in the drilling programme (URS Australia Pty Ltd, 2009a).

Disturbance to native vegetation will be minimised wherever possible, with BHP Billiton proposing to avoid large trees and significant vegetation communities (URS Australia Pty Ltd, 2009a). Disturbance to Mulga woodland and spinifex vegetation communities will be minimised by manoeuvring drill rigs around Mulga trees and driving over Spinifex for access purposes wherever practical (leaving vegetation in situ). Overhanging tree branches will be cleared where necessary, with the base of trees left intact (URS Corporation Pty Ltd, 2009a). Raised blade clearing will be undertaken for access tracks and drill lines where it is not practical to drive over vegetation. Where present, trip hazards will be removed. Lowered blade clearing will be necessary for the establishment of diamond drill pads and associated sumps. Cleared vegetation and topsoil will be stockpiled for use in rehabilitation.

Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
Comment	The vegetation condition rating is based on information provided by Western Botanical (2009a; 2009b). A majority of the proposed clearing area was rated as 'excellent' condition, with vegetation structure intact and previous disturbance (occasional tracks) affecting individual species. No introduced flora species were observed in the undisturbed native vegetation, however dead stalks of an annual species likely to have been Wards Weed (<i>Carrichtera annua</i>) were noted on calcrete soils. There is a potential for weeds to occur, however the flora and vegetation survey was undertaken at an inappropriate time of year to record their presence (Western Botanical, 2009a). A very small portion of the proposed clearing area on Mineral Claim 53/1104 was rated as 'degraded' condition, and includes previously test-mined areas rehabilitated in 2004. These areas were dominated by the aggressive weed species Ruby Dock (<i>Acetosa vesicaria</i>) and were characterised by a low proportion of local endemic species and low total plant foliage cover (Western Botanical, 2009b).

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 proposed clearing area is located approximately 110 kilometres north-west of Leinster in the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Eastern Murchison subregion is characterised by rich and diverse flora and fauna, internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (CALM, 2002). Vegetation of the subregion is dominated by Mulga woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and Halosarcia shrublands (CALM, 2002). Pastoral grazing occurs over a vast majority of the subregion, and consequently, much of the subregion has been severely degraded by feral herbivores. Mining for gold and nickel in the region is considerable, with most mining tenements occurring on pastoral land (CALM, 2002). The Australian Natural Resources Atlas (ANRA) notes that regions containing endemic species are considered to have high biodiversity conservation values because opportunities to conserve those species do not exist elsewhere; however most flora and fauna species in the Murchison bioregion are wide ranging and usually occur in adjoining regions (ANRA, 2009). Western Botanical (2009b) undertook a flora and vegetation survey over the Phase 1 resource definition drilling area (immediately adjacent to this clearing permit application) between 9 and 11 December 2008. Twenty vegetation communities were described and a total of 64 species from 31 genera and 19 families were recorded. This is considered to be relatively low species richness for the region (Western Botanical, 2009b). However, a significantly larger number of annual species would be expected in the area following suitable rainfall (Western Botanical, 2009b). A majority of the species recorded are regionally widespread and common
-----------------	---

on the soils and communities supporting them (Western Botanical, 2009b).

Whilst vegetation communities were not described for the proposed clearing area during Western Botanical's March 2009 significant flora assessment, it is expected that the vegetation communities would mirror those found during the December 2008 flora and vegetation survey of the adjacent Phase 1 area (Western Botanical, 2009a).

One Priority Flora species, two undescribed species and one species of taxonomic interest were recorded in the proposed clearing area by Western Botanical (2009a). The presence of conservation significant and poorly known flora taxa increases the biodiversity value attributed to the proposed clearing area. Should a clearing permit be granted, suitable conditions should be imposed to ensure that the proposed clearing does not significantly impact upon conservation significant and poorly known flora taxa.

Ruby Dock (*Acetosa vesicaria*) is an aggressive weed species which was recorded in rehabilitated native vegetation within the proposed clearing area. No weed species were recorded within the undisturbed native vegetation in the proposed clearing area (Western Botanical, 2009a). A formal weed assessment should be undertaken following adequate rainfall to provide a more accurate account of weed status in the area (Western Botanical, 2009b). Whilst rehabilitated native vegetation only comprises a very small fraction of the proposed clearing area, there is a risk that Ruby Dock could be spread throughout the project area as a result of native vegetation clearing if appropriate controls are not put in place. Introduced flora species such as Ruby Dock have the potential to impact upon biodiversity in a number of ways, including competition with native plant taxa for resources and increasing the risk of fire.

Care must be taken to ensure that earth-moving machinery are clean of soil material, propagules and plant material prior to:

- entering the proposed clearing area;
- exiting the proposed clearing area; and
- moving between the areas known to contain Ruby Dock and weed free areas.

Strict hygiene practices will minimise the risk of weed seeds or weed-affected soil material being introduced and spread throughout the proposed clearing area. In addition, hygiene practices will minimise the risk of weed seeds or weed-affected soil material being transported off site.

Based on a desktop fauna review, 285 vertebrate fauna species were listed as potentially occurring within the Yeelirrie Project area. This included 154 bird species, 86 reptile species, 35 mammal species and 10 frog species. This total includes 31 conservation significant species which are likely to occur in, or utilise habitat within the Yeelirrie Project area (Bamford Consulting Ecologists, 2009).

The fauna assemblage expected to occur in the proposed clearing area is diverse. The Yeelirrie area is a transition zone where ranges of species with predominantly southern, eastern and northern distributions overlap. Species typical of the Murchison, Central Desert and South-West would all be expected to occur (Bamford Consulting Ecologists, 2009).

Bamford Consulting Ecologists (2009) reports that the most significant habitats within the Yeelirrie Project area are the low calccrete rises and clay flats and claypans. Whilst these habitats may not be rich in biodiversity, they are limited in extent and may support a distinctive and restricted faunal assemblage (Bamford Consulting Ecologists, 2009).

Faunal diversity is unlikely to be impacted by this clearing proposal given the low impact, non-contiguous nature of the clearing over a much larger application area.

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

Methodology ANRA (2009).
Bamford Consulting Ecologists (2009).
CALM (2002).
Western Botanical (2009a).
Western Botanical (2009b).
GIS Database:
- Interim Biogeographic Regionalisation for Australia (Subregions).

(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**
Bamford Consulting Ecologists (2009) were commissioned by URS Australia Pty Ltd to undertake a fauna assessment of the Yeelirrie project area. The fauna assessment consisted of two phases:

1. A desktop review and brief field reconnaissance of the project area in February 2009; and
2. Detailed Level 2 field investigations undertaken in March 2009.

At the time of undertaking this assessment, Bamford Consulting Ecologists (2009) only presents findings of the desktop review and field reconnaissance, with results of the Level 2 fauna survey yet to be compiled.

The following databases and references were consulted as part of the desktop review:

- Western Australian Museum Faunabase;
- DEC's Naturemap;
- Birds Australia Atlas Database;
- DEC Threatened and Priority Fauna Database;
- EPBC Protected Matters Search Tool; and
- field guides for birds, mammals, reptiles and amphibians.

The purpose of the desktop review was to compile a list of vertebrate fauna species potentially occurring within the Yeelirrie Project area. This included 154 bird species, 86 reptile species, 35 mammal species and 10 frog species. This total includes 31 conservation significant species which are likely to occur in, or utilise habitat within the Yeelirrie Project area (Bamford Consulting Ecologists, 2009).

On 12 - 13 February 2009, Bamford Consulting Ecologists (2009) undertook a brief reconnaissance survey of the project area. The main purpose of the reconnaissance survey was to:

- identify major habitat types within the Yeelirrie Project area;
- identify the likelihood of significant species being present; and
- locate and record evidence of conservation significant species.

Bamford Consulting Ecologists (2009) identified five major fauna habitats within the Yeelirrie project area, each of which is discussed below:

1. Granite outcrops and breakaways - This habitat occurs to the north and south of the Yeelirrie Project area, being very extensive to the south. However, in a regional context this habitat is small in extent. Little, if any, of this habitat will be directly impacted by this clearing proposal (Bamford Consulting Ecologists, 2009).
2. Sandplains supporting spinifex and open Acacia/Eucalypt woodland - Whilst very extensive in the immediate Yeelirrie area, this habitat is regionally uncommon. This habitat may be important from a local biodiversity perspective as spinifex on sands are generally rich in reptile species. Significant species such as the Mulgara (*Dasycercus cristicauda*) and *Egernia kintorei* may be present here. Direct impacts to this habitat type are likely to be of a low to moderate significance as most of the habitat will not be affected (Bamford Consulting Ecologists, 2009).
3. Loam and clayey-loam plains supporting Acacia woodlands - This habitat type is extensive regionally, not species rich and not expected to support significant species. Whilst there will be some loss of this habitat, the proportional loss will be low (Bamford Consulting Ecologists, 2009).
4. Low calccrete rises with Eucalypt open woodland over a sparse shrubland - This habitat type is restricted in extent, occurring on the margins of claypan areas. It is not well represented outside of the Yeelirrie Project area. Whilst this habitat may not be species rich, it may support a distinctive and restricted faunal assemblage associated with the leaf litter and soil type present. Some lizard species and short range endemic invertebrates are examples of fauna that may be restricted to this habitat type (Bamford Consulting Ecologists, 2009). It is also noted that the largest trees in the immediate area are located in this habitat type, and may be of local importance for bird species. However, URS Australia Pty Ltd (2009a) note that impacts to large trees will be avoided wherever possible by manoeuvring vehicles and machinery around trees and significant stands of vegetation during the proposed drilling program.
5. Clayey-loam and clay flats - This habitat type is restricted in extent, with similar areas nearby appearing to be more saline (Bamford Consulting Ecologists, 2009). Leaf litter and soils in this habitat type are distinctive and may be important for some short range endemic invertebrates and some lizard species. Whilst this habitat may not necessarily be species rich, it may support a distinctive and restricted faunal assemblage (Bamford Consulting Ecologists, 2009). Direct impacts to this habitat are unlikely to be significant given the low impact, non-contiguous nature of the clearing proposal.

Habitats 4 and 5 (identified above) are likely to be the most significant fauna habitats impacted by this proposal. Whilst they may not be rich in biodiversity, they are limited in extent (on the basis of current knowledge) and may support distinctive and restricted faunal assemblage (Bamford Consulting Ecologists, 2009).

Impacts to fauna species as a result of the proposed clearing are likely to include:

- direct mortality of fauna during vegetation clearing or vehicle strike;
- minor loss of habitat for foraging, shelter and/or nesting;
- habitat fragmentation;
- increased risk of introduction of feral animals;
- noise pollution;
- direct and indirect impacts associated with dust; and

- increased risk of fire.

A number of conservation significant fauna species (mostly birds) have previously been recorded in the Yeelirrie area or are deemed to have the potential to occur in the area. However, impacts to conservation significant fauna species as a result of this clearing proposal are mostly expected to be low, based on information provided by Bamford Consulting Ecologists (2009).

For bird species, impacts are mostly deemed low because many are migratory species, some species only occur in the area as vagrants, suitable habitat exists outside the impact zone, and/or bird species have the ability to move at the onset of clearing (Bamford Consulting Ecologists, 2009).

One bird species, the Malleefowl (*Leipoa ocellata*) warrants further discussion. This species is listed as 'Vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999* and Schedule 1 - Fauna that is rare or is likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2008*.

The Malleefowl Preservation Group undertook systematic surveys for the Malleefowl at Yeelirrie Station (a Pastoral Lease covering approximately 275,000 hectares) between 2000 and 2006 and found that 10 - 20 breeding pairs of Malleefowl are estimated to occur at Yeelirrie Station (Bamford Consulting Ecologists, 2009). Some 24 Malleefowl mounds have been recorded (none within the proposed clearing area), and surveys have shown that there are at least six widely separated areas on Yeelirrie Station in which Malleefowl are resident. Bamford Consulting Ecologists (2009) notes that Malleefowl have been recorded from Acacia shrublands to the north and south of the Yeelirrie Project area. Malleefowl show a strong preference for shrubby habitat with a 2-4 metre canopy (the most common association at Yeelirrie Station) and an avoidance of other habitats (Bamford Consulting Ecologists, 2009).

Based on available information, it is possible that Malleefowl use habitat within the proposed clearing area. Should a clearing permit be granted, it is recommended that suitable conditions be imposed with respect to Malleefowl management. This should include commissioning a suitably qualified fauna specialist to search for the presence of Malleefowl mounds prior to clearing, and ensuring that no clearing occurs within 50 metres of identified Malleefowl mounds.

In addition, BHP Billiton will implement the following measures to minimise potential impacts on the Malleefowl (URS Australia Pty Ltd, 2009a):

- Malleefowl awareness will be included in site induction to all personnel; and
- Speed limits of 80 kilometres per hour on major access roads and 40 kilometres per hour within the exploration area shall be imposed. This will reduce the likelihood of vehicle strike.

Some conservation significant mammal species could potentially be present within the application area, including the Mulgara (*Dasyercus cristicauda*), Bilby (*Macrotis lagotis*), Long-tailed Dunnart (*Sminthopsis longicaudata*) and Black-footed Rock Wallaby (*Petrogale lateralis*). Impacts to the Mulgara and Long-tailed Dunnart are considered low given that most suitable habitat for these species is outside of the proposed impact zone. Pavey (2006) reports on the current known distribution of the Bilby, indicating that it is locally extinct in the Northern Goldfields. An unconfirmed sighting of two Black-footed Rock Wallabies was made from a breakaway just to the north of the Yeelirrie Project area, and if present, this could represent an isolated and relictual population. Impacts to the Black-footed Rock Wallaby are considered moderate, with little if any suitable habitat to be directly impacted. Indirect impacts such as an increase in feral predators such as the Fox pose the greatest threat to this species.

It is acknowledged that the proposed clearing will include low impact techniques such as driving over vegetation and raised blade clearing for access tracks and drill lines. Clearing will be non-contiguous and will occur within an application area of approximately 604 hectares. Widespread clearing will not take place. Provided that appropriate measures are put in place to minimise potential impacts to the Malleefowl, significant impacts to fauna or fauna habitat are unlikely.

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

Methodology Bamford Consulting Ecologists (2009).
Pavey (2006).
URS Australia Pty Ltd (2009a).

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

Comments **Proposal may be at variance to this Principle**
According to GIS Databases, there are no known records of Declared Rare Flora (DRF) in the proposed clearing area or surrounds (GIS Database). Western Botanical (2009a; 2009b) has undertaken a significant flora assessment and flora and vegetation survey in the Yeelirrie Uranium Project area and has not located any DRF taxa. It is therefore unlikely that this clearing proposal will impact upon DRF.

Three Priority Flora taxa are known from the Yeelirrie Uranium Project area (Western Botanical, 2009a; 2009b):

1. *Olearia arida* (P2);
2. *Bossiaea eremaea* (P3); and
3. *Eremophila arachnoides ssp. arachnoides* (P3)

According to information provided by Western Botanical (2009a; 2009b), neither *Olearia arida* or *Bossiaea eremaea* have been recorded in the proposed clearing area. One individual of *Bossiaea eremaea* was recorded adjacent to a track, some 500 metres north of the proposed clearing area at its nearest point. Western Botanical (2009a; 2009b) report 43 individuals of *Olearia arida* occurring at 13 locations throughout the Yeelirrie Project area, the nearest being within 500 metres of the proposed clearing area. Based on known distributions, both species may be present within the proposed clearing area.

Eremophila arachnoides ssp. arachnoides is a broom-like shrub known from the region around Yeelirrie, including Lake Mason to the south-west and Yarrabubba Station to the north-west (Western Botanical, 2009a). This species is poorly known and of limited distribution, displaying habitat specificity for calcretes of the Yeelirrie paleodrainage system. A total of 969 individuals of this species were recorded within the 50 metre wide survey corridors assessed by Western Botanical (2009a) for the Phase 2 drilling program. Measures will need to be taken to minimise the impacts on this species (Western Botanical, 2009a). The Assessing Officer, DMP, has reviewed the GPS coordinates of all locations of *Eremophila arachnoides ssp. arachnoides* recorded by Western Botanical (2009a), and only 1 of the 969 individuals recorded occur within the area subject to this clearing permit application. This has been confirmed by Western Botanical (2009a). Notwithstanding, the Assessing Officer, DMP, notes that it is possible that a larger number of individuals of this species occur within the proposed clearing area that may not have been recorded by Western Botanical (2009a).

In addition, two undescribed species were recorded within the proposed clearing area:

1. *Scaevola spinescens* (terete leaf form); and
2. *Acacia sp. fragrant*

Scaevola spinescens (terete leaf form) is a spiny shrub infrequently found on the margins of claypans supporting *Cratystylis subspinescens* - *Maireana pyramidata* Shrublands. To date, this undescribed species is known from three locations (Western Botanical, 2009b):

1. Yeelirrie orebody area (subject to this clearing permit application);
2. an un-named lake on Yakabindie Station (located approximately 45 kilometres south-east of the proposed clearing area) and;
3. Lake Miranda (located approximately 75 kilometres south-east of the proposed clearing area) (GIS Database).

All three locations of *Scaevola spinescens* (terete leaf form) are associated with calcrete, shallow sandsheet over calcrete and margins of claypans in the Yeelirrie - Lake Miranda paleodrainage (Western Botanical, 2009b). At present, surveys have not been undertaken to ascertain the full extent of this species occurrence in a local or regional sense. Current knowledge suggests that this species occurs infrequently in the landscape, and may warrant conservation status and listing as a Priority species by DEC (Western Botanical, 2009b). Approximately 148 individuals of this species were recorded within the proposed clearing area by Western Botanical (2009a) during a significant flora assessment of the Phase 2 resource confirmation drilling area.

Acacia sp. fragrant is a small tree which was found growing to 3 metres with *Acacia ramulosa ssp. ramulosa* and *Acacia aneura* in hard pan plains adjacent to calcrete (Western Botanical, 2009). Regionally, it is known from the north-eastern Goldfields. At present, surveys have not been undertaken to ascertain the full extent of this species occurrence in a local or regional sense. Current knowledge suggests that this species occurs infrequently in the landscape, and may warrant conservation status and listing as a Priority species by DEC (Western Botanical, 2009b). Approximately 18 individuals of this species were recorded within the proposed clearing area by Western Botanical (2009a) during a significant flora assessment of the Phase 2 resource confirmation drilling area.

One species of taxonomic interest (*Templetonia aff. egena*) was also recorded within the proposed clearing area. This species could not be identified to species level due to the lack of flowering and/or fruiting material. *Templetonia aff. egena* is a leafless shrub growing to 2 metres high and four metres wide on calcrete and on red clayey sands in hardpan plains near Yeelirrie homestead. Approximately 8 plants of this species were recorded within the proposed clearing area (Western Botanical, 2009a). *Templetonia egena* is widespread across most of Australia, however is uncommon to the north-eastern Goldfields. This species is restricted to the Cunyu, Melaleuca and Mileura land systems within the Yeelirrie area, and also on the Carnegie land system north of Leinster (Western Botanical, 2009b). Examination of specimens of *Templetonia egena* at the Western Australian Herbarium show considerable variation, warranting a review of the taxonomy of the species (Western Botanical, 2009b).

Until their conservation status is verified, undescribed species and taxonomic species of interest should be avoided (Western Botanical, 2009b). Whilst it may not be possible to avoid all plants, avoidance of *Scaevola*

spinescens (terete leaf form) must be treated as the highest priority as this species is not known to be either abundant or widely distributed (Western Botanical, 2009b).

BHP Billiton will employ a suitably qualified botanist to traverse the proposed drill lines during vegetation clearing to ensure that impacts to conservation significant flora taxa are minimised. BHP have committed to maintaining a 5 metre buffer around all individuals of Priority Flora taxa and undescribed flora taxa (URS Australia Pty Ltd, 2009a). The consulting botanist will also ensure that species of taxonomic interest are avoided during the clearing operations where possible (URS Australia Pty Ltd, 2009a).

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

Should a clearing permit be granted, it is recommended that suitable conditions be imposed for the purpose of flora management.

Methodology URS Australia Pty Ltd (2009a).
Western Botanical (2009a).
Western Botanical (2009b).
GIS Database:
- Declared Rare and Priority Flora List.

(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 may be at variance to this Principle

According to available GIS databases, there are no known Threatened Ecological Communities (TEC's) within the proposed clearing area (GIS Database). The nearest known TEC is the Depot Springs stygofauna community, located approximately 85 kilometres south/south-east (GIS Database).

'The Yeelirrie calcrete groundwater assemblage type on Carey paleodrainage on Yeelirrie Station' is listed as a 'Priority 1' Priority Ecological Community (PEC) by the Department of Environment and Conservation, and is considered to be threatened by mining (DEC, 2008). URS Australia Pty Ltd (2009a) note that this unique assemblage of invertebrates does not occur within the Yeelirrie Uranium Project area.

Priority 1 PEC's are defined as poorly known ecological communities with apparently few small occurrences, of which most are not actively managed for conservation. These communities are typically under immediate threat from known threatening processes across their range but have not been adequately surveyed for classification as TEC's. Priority 1 PEC's are not formally protected under the *EPBC Act 1999* (DEC, 2008).

The aquifer depth in the proposed clearing area is approximately 10 - 12 metres below the natural surface level. Hydrologists employed by URS Australia Pty Ltd (2009a) suggest that the proposed vegetation clearing would not significantly impact upon the aquifer, therefore minimal to negligible impact on stygofauna is expected (URS Australia Pty Ltd, 2009a).

Six vegetation communities associated with calcrete deposits of the Melaleuca, Mileura and Cunyu land systems appear to be regionally restricted in distribution on the basis of current information (Western Botanical, 2009b). Preliminary assessment has involved analysing land system mapping undertaken by the Department of Agriculture Western Australia (1:500,000), which has shown that land systems within the Yeelirrie Project area are small in area and widely dispersed in the Sandstone - Yalgoo - Paynes Find and North-eastern Goldfields regions. This indicates that vegetation communities may be similarly infrequent and of relatively small area (Western Botanical, 2009b).

The potentially restricted vegetation communities are:

1. *Acacia burkittii* - *Eremophila arachnoides* ssp. *arachnoides* shrubland on calcrete;
2. *Acacia burkittii* shrubland on calcrete;
3. *Casuarina pauper* woodland on calcrete;
4. *Eucalyptus gypsophila* woodland on calcrete;
5. *Melaleuca lanceolata* low forest; and
6. *Melaleuca lanceolata* - *Ptilotus obovatus* shrubland.

These six vegetation communities are associated with calcrete deposits of the Yeelirrie Paleodrainage. Calcrete communities generally have low species richness in comparison to other communities, and this tends to be a reflection of specialisation in the flora of these communities. These and other communities present within the Yeelirrie Project area will be targeted in 2009 during regional flora and vegetation surveys. This will allow habitat preferences, distribution, area of occupancy and species composition to be analysed in greater detail (Western Botanical, 2009b). It is noted that comments on vegetation communities with restricted distribution are limited to the author's knowledge in the region between Wiluna, Leinster and Yeelirrie given that regional surveys have not been conducted as yet (Western Botanical, 2009b).

ANRA (2009) note the lack of survey data for flora and fauna distributions, population sizes and habitat requirements to be amongst the highest priority data gaps for the Murchison bioregion. CALM (2002) report that limited regional vegetation and ecosystem mapping has been published for the Eastern Murchison

subregion, and is typically based on very sparse sampling. The Assessing Officer, DMP, recognizes that data gaps are present in the assessment of this clearing permit application.

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

Determination of impacts to the six potentially restricted vegetation communities is difficult given the limited information available. Whilst the proposed clearing may impact upon potentially restricted vegetation communities, it is acknowledged that the clearing proposal is low impact and non-contiguous in nature. Widespread clearing will not occur.

Methodology ANRA (2009).
CALM (2002).
DEC (2008).
URS Australia Pty Ltd (2009a).
Western Botanical (2009b).
GIS Database:
- Threatened Ecological Communities.

(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 Interim Biogeographic Regionalisation for Australia (IBRA) Murchison bioregion (GIS Database). According to Shepherd et al (2001) there is approximately 100% of the pre-European vegetation remaining in the Murchison bioregion.

The vegetation of the application area is classified as Beard Vegetation Association 18: Low woodland; Mulga (*Acacia aneura*) and Beard Vegetation Association 389: Succulent steppe with open low woodland; Mulga over saltbush. There is approximately 100% of the pre-European vegetation remaining of Beard Vegetation Associations 18 and 389 in the Murchison bioregion (Shepherd et al, 2001). These vegetation types are poorly represented within conservation reserves at both the state and bioregional level (see table below). 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 18 or 389 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
IBRA Bioregion – Murchison	28,120,558	28,120,558	~100	Least concern	1.1
Beard veg assoc. – State					
18	19,892,437	19,890,348	~100	Least concern	2.1
389	642,358	642,358	~100	Least concern	0.3
Beard veg assoc. – Bioregion					
18	12,403,248	12,403,248	~100	Least concern	0.4
389	493,979	493,979	~100	Least concern	0.4

* Shepherd et al. (2001) updated 2005

** 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).
Shepherd et al (2001).
GIS Database:
- Interim Biogeographic Regionalisation of Australia.
- Pre-European Vegetation.

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

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

According to available GIS databases, there are no permanent watercourses or wetlands within the proposed clearing area (GIS Database). Extensive claypans exist in the proposed clearing area which are subject to seasonal inundation, occurring as a result of heavy rainfall events which are usually experienced in December and January (URS Australia Pty Ltd, 2009a).

The Yeelirrie Uranium Project area is associated with a paleodrainage system, which may potentially support vegetation that depends on this system (URS Australia Pty Ltd, 2009a). The proposed clearing will not involve the removal of any deep rooted vegetation or large stands of trees (URS Australia Pty Ltd, 2009a).

Western Botanical (2009b) described 20 vegetation communities from a flora and vegetation survey covering the Phase 1 resource definition drilling area (immediately adjacent to this clearing permit application). No distinctive riparian vegetation communities were noted (Western Botanical, 2009b).

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

Methodology URS Australia Pty Ltd (2009a).
Western Botanical (2009b).
GIS Database:
- Hydrography, linear.

(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

Land system mapping by the Department of Agriculture Western Australia has mapped a variety of land systems for the Murchison bioregion. Land systems are mapped based on biophysical features such as soil and landform type, geology, geomorphology and vegetation type (Payne et al, 1998). The proposed clearing area includes three land systems (GIS Database). A broad description of each land system is given below:

1. Mileura Land System - This land system is characterised by saline and non-saline calcrete river plains and clayey floodplains interrupted by raised calcrete platforms. Tall shrublands, mixed halophytic shrublands and shrubby grasslands are described as the main vegetation types. Areas of duplex soils in this land system are moderately to highly susceptible to erosion, whilst those with loam over hardpan are less susceptible. Soils on calcrete platforms are normally not susceptible to erosion, though are widely degraded by grazing (Curry et al., 1994).

2. Bullimore Land System - This land system is characterised by gently undulating sandplain with occasional linear dunes and stripped surfaces supporting tall shrublands and hard spinifex (Curry et al., 1994). The Bullimore Land System is a very minor system in the Murchison bioregion and is not normally susceptible to erosion (Curry et al., 1994).

3. Yanganoo Land System - This land system is characterised by hardpan plains and sandy tracts with groved Mulga shrublands, hard spinifex and wanderrrie grass. Payne et al (1998) notes that this land system is generally not susceptible to soil erosion, except for drainage tracts. Impedence to sheet flows on hard pan plains has the potential to cause water starvation and potential loss of vigour in vegetation downslope (Payne et al, 1998).

With respect to this clearing proposal, the methods of clearing proposed are raised blade and lowered blade (URS Australia Pty Ltd, 2009a). Raised blade methods ensure equipment blades are above the ground level to minimise soil displacement and erosion potential. This type of clearing is preferred as it leaves soil and root systems intact and minimises erosion potential. BHP Billiton will implement raised blade clearing techniques for access tracks and drill lines, which represent a majority of the proposed clearing (URS Australia Pty Ltd, 2009a).

Lowered blade methods present a higher potential for soil displacement. However this type of clearing will only be used for diamond drill pads and associated sumps within the proposed clearing area (URS Australia Pty Ltd, 2009a).

BHP Billiton has developed a dust management plan which will minimise and manage the effects of dust generated as a result of vegetation clearing and subsequent exploration activity. Key actions outlined in the dust management plan with respect to vegetation clearing include:

- Adopting a minimum clearing policy which involves vegetation clearing only when necessary;
- Raised blade clearing to be employed for access tracks and drill lines;
- Where lowered blade clearing is undertaken, topsoil shall be scraped to a depth of 150 millimetres and stockpiled at the edge of the disturbed area; and
- Topsoil stockpiles shall not exceed 2 metres in height and shall be stabilised with salvaged vegetation, plastic liners and/or regularly wetted (URS Australia Pty Ltd, 2009b).

Should a clearing permit be granted, conditions should be imposed requiring the permit holder to undertake rehabilitation of all cleared areas following exploration activity.

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

Methodology Curry et al (1994).
Payne et al (1998).
URS Australia Pty Ltd (2009a).

URS Australia Pty Ltd (2009b).
GIS Database:
- Rangeland Land System Mapping.

(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 proposed clearing area is not within, or in close proximity to, any known conservation areas (GIS Database). The nearest known Department of Environment and Conservation managed lands are the former Lake Mason and Kaluwirri Pastoral Leases, located approximately 30 kilometres west of Yeelirrie (Bamford Consulting Ecologists, 2009). The Wanjarri Nature Reserve is located approximately 70 kilometres east/south-east (GIS Database).

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

Methodology Bamford Consulting Ecologists (2009).
GIS Database:
- CALM Managed Lands and Waters.

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

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

There are no permanent watercourses or wetlands within the proposed clearing area (GIS Database). Claypans exist within the proposed clearing area which are subject to seasonal inundation, and sheet flow originates to the north of the proposed clearing area during periods of high intensity rainfall. Sheetflows move in a southerly direction over the proposed clearing area and then flow westwards towards Lake Way, located approximately 50 kilometres from the proposed clearing area (URS Australia Pty Ltd, 2009a; GIS Database). Given that a majority of the clearing will be undertaken using raised blade techniques, it is unlikely that sheetflows would transport significant volumes of suspended sediment offsite.

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database). Groundwater in the area is of high salinity (approximately 20,000mg/L), and occurs at a depth of approximately 5 metres below ground level (URS Australia Pty Ltd, 2009a). If groundwater in the area was to rise, the high salinity content would pose a threat to plant health. However, the small and non-contiguous nature of the clearing will not be significant enough to cause the water table to rise (URS Australia Pty Ltd, 2009a).

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

Methodology URS Australia Pty Ltd (2009a).
GIS Database:
- Hydrography, linear.
- Public Drinking Water Source Areas.

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

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

The proposed clearing area is located in an arid environment which has an annual average rainfall between 200 and 250 millimetres (URS Australia Pty Ltd, 2009a). Average annual evaporation rates are in the order of 3,400 millimetres (GIS Database). Given these climatic conditions, surface water is unlikely to persist in the proposed clearing area for extended periods of time. Furthermore, it is noted that no watercourses or wetlands are present within the proposed clearing area (GIS Database; URS Australia Pty Ltd, 2009a).

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

Methodology URS Australia Pty Ltd (2009a).
GIS Database:
- Evaporation Isopleths.
- Hydrography, linear.

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

Comments

There are no native title claims over the area under application (GIS Database). 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 (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*.

One direct interest party submission was received, requesting that heritage surveys be conducted prior to

vegetation clearing. According to available databases, there are no registered Sites of Aboriginal Significance within 2 kilometres of 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.

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.

Methodology GIS Database:
- Aboriginal Sites of Significance.
- Native Title Claims.

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and the proposed clearing may be at variance to Principles (c) and (d), is not likely to be at variance to Principles (a), (b), (f), (g), (h), (i) or (j) and is not at variance to Principle (e).

Should a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, flora management, fauna management, rehabilitation, record keeping and permit reporting.

5. References

- Australian Natural Resource Atlas (ANRA) (2009) Biodiversity Assessment – Murchison bioregion. Available: www.anra.gov.au/topics/vegetation/assessment/wa/ibra-murchison.html. Accessed: 14 April 2009. Published by the Department of the Environment and Water Resources.
- Bamford Consulting Ecologists (2009) Desktop Fauna Assessment of the Yeelirrie Project Area. Prepared for URS Australia Pty Ltd.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Murchison 1 (MUR 1 - East Murchison subregion).
- Curry, P.J., Payne, A.L., Leighton, K.A., Hennig, P., Blood, D.A (1994) Technical Bulletin No. 84: An inventory and condition survey of the Murchison River catchment and surrounds, Western Australia. Department of Agriculture, Western Australia, South Perth.
- DEC (2008) Priority Ecological Communities for Western Australia - 27 August 2008. Available: <http://www.dec.wa.gov.au/management-and-protection/threatened-species/wa-s-threatened-ecological-communities.html> Accessed: 7 April 2009.
- 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.
- Pavey, C. (2006) National Recovery Plan for the Greater Bilby (*Macrotis lagotis*). Northern Territory Department of Natural Resources, Environment and the Arts.
- Payne, A.L., Van Vreeswyk, A.M.E., Pringle, H.J.R., Leighton, K.A, Hennig, P (1998) Technical Bulletin No. 90: An inventory and condition survey of the Sandstone-Yalgoo-Paynes Find area, Western Australia. Department of Agriculture, Western Australia, South Perth.
- 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 (updated 2005).
- URS Australia Pty Ltd (2009a) Clearing Permit Application (CPS 2965/1) Yeelirrie Uranium Project. Prepared for BHP Billiton Yeelirrie Development Company Pty Ltd.
- URS Australia Pty Ltd (2009b) Dust Management Plan for Drilling Activities at the Yeelirrie Uranium Project Site. Prepared for BHP Billiton Yeelirrie Development Company Pty Ltd, 7 April 2009.
- Western Botanical (2009a) Significant Flora Assessment of Remainder of Proposed Confirmation Drilling Program – Phase 1B Yeelirrie Uranium Deposit: March 2009. Prepared for URS Corporation Pty Ltd.
- Western Botanical (2009b) Flora and Vegetation Assessment of Portion of Proposed Confirmation Drilling Program - Part 1: Yeelirrie Uranium Deposit. December 2008. Prepared for URS Corporation Pty Ltd.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
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.
DMP	Department of Mines and Petroleum, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
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.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

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.