



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5296/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Phillip John Bywaters

1.3. Property details

Property: Mining Lease 70/1079
Local Government Area: Shire of Dalwallinu
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
13.5		Mechanical Removal	Gypsum Mining

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 15 November 2012

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 is located within the application area (GIS Database):

125: Bare areas; salt lakes.

A flora and vegetation survey of the application area conducted by Ian Fordyce and Associates (Fordyce) on 24 to 26 March 2011 identified the following five vegetation units within the application area (Fordyce, 2011):

1. Sheoak (*Casuarina obesa*) open woodland on tall dunes of pale pinkish brown, gypsiferous sand.
2. Abandoned and partially rehabilitated mining pits, where the gypsum sand has already been removed. The floor is a distinctive white, sandy clay.
3. Bare (or almost bare) pale sand dunes - grassy with scattered trees. This unit includes the pale yellow and pale brown gypsum dunes where future mining is planned.
4. Lake-floor samphire, an almost monotypic shrubland/herbland of *Tecticornia loriae* on pale yellow silt, clay and fine-grained sand.
5. Mallee saltbush (*Atriplex stipitata*) with scattered trees on a single, low, arcuate dune near the northwestern end of the tenement area. The substrate here is a distinctive reddish yellow, medium to coarse-grained, well-sorted, quartz sand.

Clearing Description

Phillip John Bywaters has applied to clear 13.5 hectares within an application area of approximately 33.5 hectares (GIS Database). The application area is located approximately 37 kilometres north east of Wubin (GIS Database).

The purpose of the application is to undertake gypsum mining on Lake Goorly. This includes mining from dunes that have mounded resources of up to three metres above the lakebed. Clearing will be by mechanical means. Vegetation and topsoil will be stockpiled for use in rehabilitation.

Vegetation Condition

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

To

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

Comment

Vegetation condition is based on information provided by Fordyce (2011) and aerial imagery (GIS Database).

According to Newland Environmental Pty Ltd (Newland) (2012), gypsum mining has been undertaken on Lake Goorly for the past nine years. Previous mining and partial rehabilitation has been conducted within the

3. Assessment of application against clearing principles

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

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

The application area occurs within the AW1 - Ancient Drainage subregion of the Avon Wheatbelt bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). This subregion is characterised by proteaceous scrubheaths, rich in endemics, on residual lateritic uplands and derived sandplains; mixed eucalypt, *Allocasuarina huegeliana* and Jam-York Gum woodlands on Quaternary alluvials and eluvials. (CALM, 2002). There is no connected drainage; salt lake chains occur as remnants of ancient drainage systems that now only function in very wet years (CALM, 2002). CALM (2002) notes that gypsum dunes have special value as plant species are generally unique to each IBRA region and often smaller scales (Mattiske Consulting, 1995). Several Threatened Flora and Priority Flora species are restricted to gypsiferous habitats, and at least 80 species are likely to be gypsiphillic (Mattiske Consulting, 1995).

A regional survey report by Anne (Coates) Rick (Rick, 2011) also recognised plant communities growing on gypsum as potentially conservation significant. This included a survey of plant communities growing on gypsum in the wheatbelt and an analysis of data collected during several previous surveys across the wheatbelt. A total of 446 plant species were identified with ten considered as possible gypsophiles (none of which were recorded in the vegetation survey of the application area). Rick (2011) states that most of the 446 species occur widely on other soil types and are probable refuges from adjacent plant communities. No significant differences were found between the species composition of the lakes studied in the northern section of the study area (Damboring, Gunyiddi-Latham, Lake Moore and Cowcowing Lake Systems) where Lake Goorly is located.

A total of 43 species from 19 families were recorded on Mining Lease 70/1079 (Fordyce, 2011). Five vegetation units were described including Sheoak open woodland, abandoned and partially rehabilitated mining pits, bare (or almost bare) pale sand dunes, lake-floor samphire and mallee saltbush. The substorey within these vegetation units was generally found to be sparse or entirely absent and bare areas were noted across the survey area. Fordyce (2011) has found the lake floor flora at Lake Goorly as having low species diversity compared with other saline wetlands. Fordyce (2011) notes that salt lake margins are represented by both wetland and terrestrial flora including species with moderate salt-tolerance and narrow distribution and can therefore have increased biodiversity. However, Fordyce (2011) concludes that on the whole the lake-shore vegetation at Lake Goorly is broadly similar to vegetation at saltlake margins throughout the Yarra Yarra region and that common small trees/large shrubs within the application area are often present as canopy dominants nearby.

One introduced species, Afghan thistle (*Solanum hystrix*), was recorded within the application area (Fordyce, 2011). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened or Priority Flora or Threatened or Priority Ecological Communities have been recorded within the application area (GIS Database; Newland, 2012). One Priority 1 flora species, *Acacia inceana* subsp. *latifolia*, was recorded within Mining Lease 70/1079 but outside the application area. At least 40 individuals were counted and extrapolation of its density over apparently similar habitat to the northeast estimated the population at several thousand (Fordyce, 2011). This species was observed as a common canopy tree/shrub in the mixed acacia-eremophila vegetation unit. This vegetation unit has been excluded from the application area and a minimum buffer of 50 metres has been implemented between the application area and the *Acacia inceana* subsp. *latifolia* recorded during the vegetation survey. Newland (2012) also states that the boundary of the population will be demarcated with flagging or fencing. Based on the above, the proposed clearing is unlikely to significantly impact this species.

According to the online Department of Environment and Conservation (DEC) database, Naturemap, 12 mammal, 86 bird, three amphibian and 36 reptile species have been recorded within a 20 kilometre radius of the application area (DEC, 2012). This indicates moderate faunal diversity. Based on the sparseness of the vegetation and prior mining disturbance it is unlikely the application area comprises a higher level of faunal diversity than adjacent vegetated areas.

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

Methodology CALM (2002)
DEC (2012)
Fordyce (2011)
Mattiske Consulting (1995)
Newland (2012)
Rick (2011)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Threatened Ecological Sites Buffered
- Threatened and Priority Flora

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

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

A resource condition study was conducted by the Department of Environment and Conservation (DEC) for Lake Goorly in July 2009. This study considered the ecological character and condition of Lake Goorly and included a survey for aquatic invertebrates, fish, waterbirds and terrestrial vertebrates (DEC, 2008).

No terrestrial vertebrates or fish were reported as occurring by DEC (2008). Fifteen invertebrate species have been recorded, all of which were considered to be widespread species (DEC, 2008). Jellison (2005) reports that the most widely recognised ecological value of salt lakes is as habitat for migratory and nesting populations of birds. DEC (2008) reported that 11 waterbird species have previously been recorded at Lake Goorly, six of which are currently conservation significant species. This number was considered low and was attributed to the low intensity and number of fauna surveys conducted for Lake Goorly as well as the low diversity of roosting and breeding habitat for waterbirds (DEC, 2008).

Based on habitat preference or recorded locations, Newland (2012) identified 13 conservation significant fauna species that either occurred, or have the potential to occur at Lake Goorly. These are all bird species with six previously recorded at Lake Goorly as reported by DEC (2008). The previously recorded species include the Gull-billed Tern (*Gelochelidon nilotica*) (EPBC Act Marine), Hooded Plover (*Charadrius rubricollis*) (EPBC Act Marine; Priority 4), Red-capped Plover (*Charadrius ruficapillus*) (EPBC Act Marine), Red-necked Avocet (*Recurvirostra novaehollandiae*) (EPBC Act Marine), Silver Gull (*Larus novae-hollandiae*) (EPBC Act Marine) and Whiskered Tern (*Chlidonias hybridus*) (EPBC Act Marine). However, given the size of Lake Goorly (approximately 21,600 hectares), the similar vegetation found along its margin and the sparse and partially disturbed nature of the application area, it is unlikely the application area represents significant habitat for these bird species.

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

Methodology DEC (2008)
Jellison (2005)
Newland (2012)

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

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

According to available databases, there are no records of Threatened Flora within the application area (GIS Database). The nearest record of Threatened Flora is located approximately 30 kilometres west of the application area (GIS Database).

No Threatened Flora was recorded during the vegetation survey undertaken on 24 to 26 March 2011 (Fordyce, 2011).

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

Methodology Fordyce (2011)
GIS Database:
- Threatened and Priority Flora

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

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

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is approximately 80 kilometres north west of the application area (GIS Database).

No TECs were recorded during the vegetation survey undertaken on 24 to 26 March 2011 (Newland, 2012).

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

Methodology Newland (2012)
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 may be at variance to this Principle

The application area falls within the Avon Wheatbelt Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 18.2% of the pre-European vegetation remains (see table) (GIS Database,

Government of Western Australia, 2011). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), this value gives the region a Conservation Status of 'Vulnerable'.

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

125: Bare areas; salt lakes.

Approximately 94% and 39% of this Beard vegetation association remains at a state and bioregional level, respectively (Government of Western Australia, 2011) (see table). This is above the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation below which, species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000).

The description of this Beard vegetation association is not consistent with vegetation identified within the application area. Based on this, it is difficult to determine the regional vegetation representation. However, given the vegetation mapping has been undertaken on a regional scale, it is likely Beard vegetation association 125 would include other areas of vegetation occurring on gypsum dunes and lake floors. Fordyce (2011) found that on the whole the lake-shore vegetation at Lake Goorly is broadly similar to vegetation at saltlake margins throughout the Yarra Yarra region and that common small trees/large shrubs within the application area are often present as canopy dominants nearby.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA bioregion – Avon Wheatbelt	9,517,110	1,732,027	~18.20	Vulnerable	~1.80 (~7.23)
IBRA Subregion - Avon Wheatbelt P1	6,524,180	1,322,408	~20.27	Vulnerable	~1.87 (~6.74)
Local Government - Dalwallinu	722,880	205,288	~28.40	Vulnerable	~1.06 (~3.71)
Beard vegetation associations - State					
125	3,492,381	3,269,266	~93.61	Least Concern	~7.20 (~5.35)
Beard vegetation associations - Bioregion					
125	167,448	65,842	~39.32	Depleted	~18.96 (~4.17)
Beard vegetation associations - Subregion					
125	148,564	63,181	~42.53	Depleted	~ 15.26 (~1.88)

* Government of Western Australia (2011)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)	
Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status	

The application area is located within an area that has been extensively cleared (GIS Database). Salt lakes comprise a majority of the uncleared land in the Shire of Dalwallinu, and are significant remnants within the Shire and local area. The lakes are important for fauna as they provide refuge and an ecological linkage between remaining vegetated areas.

Aerial imagery shows the application area is sparsely vegetated and is comparable to vegetation seen in Lake Goorly (GIS Database). Fordyce (2011) states that the hinterland beyond the eastern end of the lake has been largely cleared for cereal cropping, but includes remnants of York gum woodland and mixed acacia shrubland/thicket developed on reddish brown sandy loams. A small portion of the mixed acacia shrubland/thicket was identified within Mining Lease 70/1079, however, this vegetation unit has been excluded from the application area. Considering the application area excludes this vegetation, is sparsely vegetated and has previously been disturbed it is unlikely to represent a significant remnant of native vegetation.

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

EPA (2000)
Fordyce (2011)
Government of Western Australia (2011)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- Mongers 50cm Orthomosaic – Landgate 2004/2005
- 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 application area is located on the margin of Lake Goorly, a large salt lake that is dry for extended periods and then inundates either partially or totally on an intermittent basis (Newland, 2012, GIS Database). The application area consists of dunes and lake floor located on the eastern shoreline of Lake Goorly. Lake Goorly is located in the Yarra Monger Catchment within the Yarra Yarra Drainage Basin and is part of a chain of several thousand ephemeral saltlakes, playas and samphire-covered claypans, that stretch for approximately 300 kilometres and cover an area of 250,000 hectares (DEC, 2008). The major lakes in the system include Nullewa Lake, Weelhamby Lake, Mongers Lake, Lake DeCourey, Lake Goorly, Lake Hillman and Yarra Yarra Lake, which is the terminal point of the system (Fordyce, 2005) (cited in DEC, 2008). Due to the flat terrain of the Yarra Yarra system, drainage is generally uncoordinated and each lake has its own internal drainage system, however, in wet years, the lakes overflow along a broad drainage line, ending in Yarra Yarra Lake (Fordyce, 2005; NACC, 2005) (cited in DEC, 2008).

Given the application area occurs on the shoreline of a lake, vegetation within the application area is growing in association with a waterbody. However, Fordyce (2011) found that on the whole the lake-shore vegetation at Lake Goorly is broadly similar to vegetation at saltlake margins throughout the Yarra Yarra region. Given the size of the lake (approximately 21,600 hectares) and previous mining activities undertaken, the proposed clearing is not expected to have any significant additional impacts on the hydrological values of Lake Goorly.

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

Methodology DEC (2008)
Fordyce (2011)
Newland (2012)
GIS Database:
- Geodata, Lakes
- Hydrography, linear

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

Comments Proposal may be at variance to this Principle

Previous land degradation advice has been provided by the Department of Agriculture and Food (DAFWA) in 2006 and 2010 for clearing permits located on the lake bed of Lake Goorly (CPS 1012/1, 1382/1 and 3745/1). More recent DAFWA advice was obtained for a clearing permit located approximately 40 kilometres south, south east in adjacent Lake Hillman (CPS 4961/1).

According to the decision report for CPS 3745/1, DAFWA advised that the proposed clearing is in an area of primary salinity and is unlikely to be a land degradation hazard (DMP, 2010). This is supported by previous advice for CPS 1012/1 and 1382/1 that the proposed gypsum mining operation is unlikely to cause land degradation in the form of on-site or off-site salinity, soil erosion or eutrophication (DMP, 2010).

DAFWA advice provided in May 2012 for CPS 4961/1 is also considered applicable as this clearing permit is located on gypsum dunes in the neighbouring salt lake known as Lake Hillman. DAFWA (2012) noted that the application area is within an area of primary salinity and states that no significant change in salinity is expected as a result of the proposed clearing. The potential for land degradation from salinity, eutrophication, water erosion, flooding and waterlogging as a result of the proposed clearing was assessed to be low (DAFWA, 2012). However, the risk of wind erosion was assessed to be very high once the protective vegetation is removed. DAFWA (2012) advised that this risk can be managed by careful management of topsoil and vegetation residue during the clearing operation for the progressive rehabilitation of disturbed cells after mining.

Bywaters Gypsum Supplies has committed to progressive rehabilitation with only a few mining areas being open at any one time. A maximum annual mining rate of two hectares is proposed and on average the rate of mining will equal the rate of progressive rehabilitation (Newland, 2012). Rehabilitation will aim to restore the area to an environment similar to pre-mining condition consisting of flat topography, low dunes and chenopod - samphire vegetation (Newland, 2012).

Based on the above, wind erosion may occur within the application area. Potential impacts from wind erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology DAFWA (2012)
DMP (2010)
Newland (2012)

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

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

The application area does not lie within any conservation areas or Department of Environment and Conservation managed lands (GIS Database). The nearest conservation area is the Jibberding Nature Reserve, located approximately 15 kilometres south west of the application area (GIS Database). Based on the distance between the application area and the Jibberding Nature Reserve, the proposed clearing is not likely to impact the environmental values of any conservation area.

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

Methodology GIS Database:
- DEC Tenure

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

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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The application area is located on the eastern shoreline of Lake Goorly. This large salt lake is dry for extended periods and holds water only briefly after rain (Newland, 2012, Fordyce, 2011). In wet years the lake may overflow and connect with other salt lakes in the Yarra Monger Catchment (Fordyce, 2005; NACC, 2005) (cited in DEC, 2008).

Lake Goorly has a shallow water table and contains water that is highly saline. According to available databases, groundwater salinity within the application area is in excess of 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). DEC (2008) noted that high nutrients in the water were indicative of nutrient enrichment from surrounding agricultural lands. The bed of the salt lake contains depressions within which water accumulates following significant rainfall events, however the proposed gypsum mining operation is confined to the dry gypsum deposits above the water table. Based on the above, the proposed clearing is unlikely to significantly impact surface or underground water quality.

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

Methodology DEC (2008)
Fordyce (2011)
Newland (2012)
GIS Database:
- Groundwater Salinity, Statewide
- 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 application area is located within the Yarra Monger catchment area (GIS Database). Given the size of the area to be cleared (13.5 hectares) in relation to the size of the catchment area (4,182,476 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

Lake Goorly is an ephemeral saline lake that alternates from being totally dry to total or partial ponding (Newland, 2012). The scale of the proposed clearing (13.5 hectares) in relation to the size of Lake Goorly (approximately 21,600 hectares) is unlikely to increase the potential for flooding.

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

Methodology Newland (2012)
GIS Database:
- Geodata, Lakes
- 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: WC97/72 (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant groups. 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 is one registered Aboriginal Site of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of 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 application was advertised on 22 October 2012 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology

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

4. References

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- DAFWA (2012) Advice to the assessing officer for clearing permit application CPS 4961/1. Received on 28 May 2012.
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- DEC (2012) NatureMap - Mapping Western Australia Biodiversity, Department of Environment and Conservation. <http://naturemap.dec.wa.gov.au/default.aspx>, viewed November 2012.
- 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.
- DMP (2010) Clearing Permit Decision Report for CPS 3745/1. Prepared by the Department of Mines and Petroleum, 1 July 2010.
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- Fordyce (2011) Vegetation and Flora Survey of Lake Goorly, particularly areas of proposed disturbance with gypsum mining operations on M70/1079, 1114, 1115, 1118, 1191, 1255, 1256, 1257, 1258, 1259, 1272, and E70/3099, and associated special-purpose tenements. Unpublished report dated 5 April 2011.
- Government of Western Australia (2011) 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.
- Jellison (2005) Commentary - Saline Systems: IX international conference on salt lake research: Research opportunities and management challenges. Available: <http://www.salinesystems.org/content/1/1/12>.
- 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 (1995) A Review of Botanical values on a range of gypsum dunes in the Wheatbelt of Western Australia. Final report for Australian Nature Conservation Agency Save the Bush Program 1993/94 Project SS6007 Part-A. Department of Conservation and Land Management. Prepared for Department of Conservation and Land Management, Western Australia.
- Newland (2012) Bywaters Gypsum Supplies Mining Proposal for Gypsum Mining at Lake Goorly on M70/1079. Unpublished report prepared by Newland Environmental Pty Ltd for Bywaters Gypsum Supplies. Dated January 2012.
- Rick (2011) Survey and Analysis Of Plant Communities Growing On Gypsum In The Western Australian Wheatbelt. Botanical Consultants Report for the Wheatbelt NRM Region and the Department of Environment and Conservation Western Australia by Anne (Coates) Rick. Dated 2011.

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	Environmental 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.