



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5955/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Phillip and Craig Bywaters

1.3. Property details

Property:
Mining Lease 70/1079
Mining Lease 70/1114
Mining Lease 70/1115
Mining Lease 70/1118
Mining Lease 70/1191
Mining Lease 70/1255
Mining Lease 70/1256
Mining Lease 70/1257
Mining Lease 70/1258
Mining Lease 70/1259
Mining Lease 70/1272
Mining Lease 70/1312
General Purpose Lease 70/200
Miscellaneous Licence 70/72
Miscellaneous Licence 70/84
Miscellaneous Licence 70/141
Local Government Area: Shire of Dalwallinu
Colloquial name: Lake Goorly Gypsum Operation

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 27 March 2014

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 associations are located within the application area (GIS Database):

125: Bare areas; salt lakes; and
676: Succulent steppe; samphire.

Three flora and vegetation surveys have been conducted over the application area. The first was conducted for Mining Leases 70/1118, 70/1191 and 70/1256 by Ian Fordyce and Associates (Fordyce) on 11 November 2009 (Fordyce, 2010). The second survey was conducted for all the Lake Goorly tenements, focusing on areas of proposed disturbance and was conducted between 24 and 26 March 2011 (Fordyce, 2011). The third survey was conducted over Mining Lease 70/1312 by Newland Environmental Pty Ltd (Newland) on 29 October 2013 (Newland, 2013a). The following eight vegetation units have been identified within the application area (Newland, 2013b):

Lake Floor

1. Simple samphire open shrubland, generally 20 – 30 centimetres tall. Cover is irregular – some parts are almost entirely bare; on most of the sandy (gypsiferous) section, cover varies from <1% to 15% but is usually <10%. Almost all the samphire is a distinctive bluish grey variety (*Tecticornia loriae*).

Lake Margin

2. Lake-floor samphire, as described under the first vegetation unit above. An almost monotypic shrubland/herbland of *Tecticornia loriae* on pale yellow silt, clay and fine-grained sand.

3. Lake floor samphire - Low scattered shrubs of *Tecticornia disarticulata* (0.5 metres by 2%) with *Frankenia cinerea* (0.2 metres by 1%) on lake floor.
4. Sheoak (*Casuarina obesa*) open woodland on tall dunes of pale pinkish brown, gypsiferous sand.
5. Abandoned and partially rehabilitated mining pits, where the gypsum sand has already been removed. The floor is a distinctive white, sandy clay.
6. 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.
7. 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.
8. Grassy dunes with scattered trees - very open tussock grassland of *Austrostipa eremophila* (glabrous form) (0.3 metres by 2%) with scattered low trees of mixed *Acacia* Sp. (3-4 metres by +) on gypsum sand dune.

Clearing Description	<p>Lake Goorly Gypsum Operation.</p> <p>Phillip John Bywaters and Craig Anthony Bywaters (Bywaters) proposes to clear up to 84.47 hectares of native vegetation within a total boundary of approximately 971.6 hectares, for the purpose of gypsum mining on Lake Goorly. The project is located approximately 30 kilometres north east of Wubin, in the Shire of Dalwallinu.</p>
Vegetation Condition	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994);</p> <p>To</p> <p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>
Comment	<p>The purpose of the application is to continue gypsum mining on Lake Goorly. This clearing permit application is also intended to replace previously approved clearing permits (Newland, 2013b). It also includes all the Bywaters Lake Goorly mining tenements to allow for long term ongoing mining rather than submitting multiple applications on a campaign basis (Newland, 2013b). The proposed footprint includes an ongoing mining disturbance of approximately 15 hectares per annum (totals 75 hectares over five years), 1.75 hectares for processing and stockpiling and 7.72 hectares for road development (Newland, 2013b). The gypsum resource occurs in shallow deposits across areas of the lake floor at depths of between 0.3 and 1 metre and from a raised dune deposit on the lake margin (Newland, 2013b).</p> <p>Vegetation condition is based on the flora and vegetation surveys undertaken and aerial imagery (GIS Database).</p> <p>The Lake Goorly Operation commenced in 2003. Previous mining has occurred on Mining Leases 70/1079 (lake margin), 70/1118 (lake floor) and 70/1191 (lake floor) (Newland, 2013b). Gypsum resources remain on Mining Leases 70/1079 and 70/1118 and mining may be recommenced. Mining Lease 70/1191 contains currently active mining operations (Newland, 2013b). The remaining mining tenements have not been disturbed by mining activities. According to Newland (2013b), 83.81 hectares has been previously disturbed by the operations, 76.11 hectares of which has been rehabilitated. Two live clearing permits (CPS 3745/2 and CPS 5296/1) and five expired clearing permits (CPS 1012/2, CPS 1382/2, CPS 2260/1, CPS 2762/1, CPS 3733/1) occur in the application area. This application intends to replace clearing under the two live clearing permits. The expired and current permits listed above approved 119.87 hectares of clearing. Of this, 36.52 hectares was cleared (Newland, 2014). A total of 83.35 hectares of previously approved clearing has therefore not been cleared. Given this application will cover the expired and current clearing permits, the proposed clearing of 84.47 hectares under this application will result in a 1.12 hectare increase above what remained uncleared (83.35 hectares) under the previously approved total clearing amount (119.87 hectares).</p>

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) (cited in CALM, 2002). Several Threatened Flora and Priority Flora species are restricted to gypsiferous habitats, and at least 80 species are likely to be gypsiphyllic (Mattiske Consulting, 1995) (cited in CALM, 2002).

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 have been recorded in 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 (Rick, 2011).

A combined total of 57 species from 21 families were recorded during the three flora and vegetation surveys (Newland, 2013b). Eight vegetation units were described including lake-floor samphire, Sheoak open woodland, abandoned and partially rehabilitated mining pits, bare (or almost bare) pale sand dunes, shrubland/woodland mallee saltbush and grassy dunes with scattered trees. Where it existed the substorey was found to be sparse. Fordyce (2011) 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, 2013b). 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 imposed between the application area and the boundary of the *Acacia inceana* subsp. *latifolia* population (Newland, 2013b). Newland (2013b) 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 Naturemap (DEC, 2014), 12 mammal, 98 bird, three amphibian, 15 invertebrate and 37 reptile species have been recorded within a 20 kilometre radius of the approximate centrepoin of the application area. This indicates moderate faunal diversity. Based on the generally sparse 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 (2014)
Fordyce (2011)
Newland (2013b)
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 August 2008. This study considered the ecological character and condition of Lake Goorly and included a survey for aquatic invertebrates, fish, waterbirds and terrestrial vertebrates (DEC, 2009a).

No terrestrial vertebrates or fish were reported as occurring by DEC (2009a). Fifteen invertebrate species have been recorded, all of which were considered to be widespread species (DEC, 2009a). Jellison (2005) reports that the most widely recognised ecological value of salt lakes is as habitat for migratory and nesting populations of birds. DEC (2009a) 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 lack of upper storey vegetation and low diversity of roosting and breeding habitat for waterbirds (DEC, 2009a).

Based on habitat preference or recorded locations, Newland (2013b) 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 (2009a). 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 novaehollandiae*) (EPBC Act Marine) and Whiskered Tern (*Chlidonias hybridus*) (EPBC Act Marine). However, given Lake Goorly and associated fringing areas cover approximately 21,600 hectares (Newland, 2013b) and the similar vegetation

found within the lake bed and along its margin, it is unlikely the proposed clearing of 84.47 hectares will have a significant impact on these species.

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

Methodology DEC (2009a)
Jellison (2005)
Newland (2013b)

(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 Naturemap (DEC, 2014), the Threatened Flora species, *Frankenia conferta*, has been recorded in close proximity to the application area. Based on Naturemap (DEC, 2014), this species was recorded on 9 September 1998 during the Salinity Action Plan Wheatbelt Flora survey. It appears it was recorded in close proximity to General Purpose Lease 70/200 near the lake shoreline.

Frankenia conferta occurs around the high water mark of lake shorelines to the tops of low berms within saline pans; and on the floor of major drainage lines within localised swales where they are subject to seasonal inundation (DEC, 2009b). It grows among other halophytic shrubs on clay sands with gypsum or white-grey shallow sand over clay (DEC, 2009b). The species has been recorded in the Avon Wheatbelt, Coolgardie and Geraldton Sandplains bioregions and is known from 24 records (Western Australian Herbarium, 2014).

This species was included in the targeted Threatened Flora search undertaken during the flora and vegetation surveys (Newland, 2014). No specimens of *Frankenia conferta* were encountered during the flora and vegetation surveys. It was also not encountered during numerous surveys carried out in the area by Fordyce (as part of the Yarra Yarra Catchment Management Group) in 2005 (Newland, 2014).

The 1998 Naturemap record of *Frankenia conferta* indicates the species may occur in the application area in areas of suitable habitat. However, the species was not recorded during flora and vegetation surveys of the application area and in other surveys carried out in the area in 2005. According to Newland (2013b), Lake Goorly and associated fringing areas occupy approximately 21,600 hectares. This indicates the proposed clearing represents a small portion of available habitat in the local area. Based on this and given the species has not been recorded in the application area, the risk to *Frankenia conferta* as a result of the proposed clearing is considered to be low.

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

Methodology DEC (2009b)
DEC (2014)
Newland (2013b)
Newland (2014)
Western Australian Herbarium (2014)

(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 75 kilometres north west of the application area (GIS Database).

No TECs have been recorded during the flora and vegetation surveys (Newland, 2013b).

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

Methodology Newland (2013b)
GIS Database:
- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

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

The application area falls within the Avon Wheatbelt Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 18.7% of the pre-European vegetation remains (see table below) (GIS Database, Government of Western Australia, 2013). 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 associations (GIS

Database):

125: Bare areas; salt lakes; and
676: Succulent steppe; samphire.

Approximately 90.2% and 9.8% of Beard vegetation association 125 remains at a state and bioregional level, respectively (see table below) (Government of Western Australia, 2013). Approximately 95.2% and 24.4% of Beard vegetation association 676 remains at a state and bioregional level, respectively (Government of Western Australia, 2013). The bioregional levels are below 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). There has been extensive clearing within the Avon Wheatbelt bioregion.

The majority of the application area (91%) has been mapped as Beard vegetation association 676 (GIS Database). The only portion of the application area mapped as Beard vegetation association 125 is a dune system on the edge of Lake Goorly. Beard vegetation association 125 is described as bare areas; salt lakes; whereas vegetation on the dune system was mapped as lake-floor samphire; Sheoak open woodland; abandoned and partially rehabilitated mining pits; bare (or almost bare) pale sand dunes; mallee saltbush; and grassy dunes with scattered trees. This indicates that the regional vegetation description is not representative of vegetation mapped during the flora and vegetation surveys.

According to Newland (2013b), Lake Goorly and associated fringing areas occupy approximately 21,600 hectares. Aerial imagery indicates Lake Goorly remains largely undisturbed and that similar vegetation exists outside the application area within the lake (GIS Database). The area to the east, south and west of the lake has been extensively cleared for agriculture indicating the lake is a remnant within the local area. Another remnant can also be seen to the north/north-east of Lake Goorly. This corresponds with the White Wells Vacant Crown Land Register of National Estate (RNE) site which is approximately three kilometres north east of the application area and occupies approximately 35,885 hectares (Newland, 2013b). This RNE contains a large and relatively intact area of native vegetation types representative of the eastern wheat belt region (extensive areas of sand plain vegetation, salina and intersalina dune complexes and salmon and York gum woodlands) (Department of the Environment, 2014).

The proposed clearing of 84.47 hectares will impact 0.4% of Lake Goorly and its associated fringing areas. The flora and vegetation surveys generally found vegetation within the application area to be sparse (Fordyce, 2011; Newland, 2013a). This is also evident on aerial imagery (GIS Database). Previous mining operations have also occurred within the lake floor and dune system of the application area. Given similar vegetation exists outside the application area, the size of Lake Goorly and the generally sparse nature of vegetation, it is unlikely the proposed clearing of 84.47 hectares will impact on a significant ecological linkage or refuge function for fauna.

Whilst the bioregional representation of Beard vegetation associations is poor and the application area is within an area that has been extensively cleared, it is not considered a significant remnant and the proposed clearing of 84.47 hectares is not likely to have a significant impact on the remnant in which it is located (Lake Goorly).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Extent in DEC Managed Lands %* (and post clearing %)
IBRA bioregion – Avon Wheatbelt	9,517,110	1,778,407	~18.69	Vulnerable	~2.37 (~9.62)
IBRA Subregion - Merredin	6,524,180	1,368,789	~20.98	Vulnerable	~2.50 (~9.12)
Local Government - Dalwallinu	722,663	167,910	~23.23	Vulnerable	~1.06 (~4.50)
Beard vegetation associations - State					
125	3,485,787	3,146,091	~90.25	Least Concern	~8.95 (~8.07)
676	2,063,414	1,963,895	~95.18	Least Concern	~11.33 (~11.87)
Beard vegetation associations - Bioregion					
125	167,448	16,356	~9.77	Endangered	~20.04 (~20.25)
676	124,573	30,396	~24.40	Vulnerable	~0.33 (~1.29)
Beard vegetation associations - Subregion					
125	148,564	13,695	~9.22	Endangered	~ 16.48 (~12.78)
676	124,377	30,358	~24.41	Vulnerable	~ 0.33 (~1.29)

* Government of Western Australia (2013)

** 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	

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

Methodology Department of Natural Resources and Environment (2002)
 Department of the Environment (2014)
 EPA (2000)
 Fordyce (2011)
 Government of Western Australia (2013)
 Newland (2013a)
 Newland (2013b)
 GIS Database:
 - Dalwallinu 50cm Orthomosaic - Landgate 2006
 - IBRA WA (Regions – Sub Regions)
 - Kalannie 2337 Mar 2011 Mosaic
 - Mongers 50cm Orthomosaic – Landgate 2004/2005
 - Mount Gibson 80cm Orthomosaic - Landgate 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 lake floor and margin of Lake Goorly, a large salt lake that is dry for extended periods and then inundates on an intermittent basis (Newland, 2013b, GIS Database). The lake bed alternates from being totally dry to times with total or partially ponding, as part of the inundation and desiccation cycle (Newland, 2013b). Water levels are shallow due to the flat topography. The majority of the application area is located on the lake floor with a small portion occurring on the lake shoreline including a dune system found on the eastern shoreline of Lake Goorly. A series of hydrologically linked claypans and smaller saline lakes surround Lake Goorly (Newland, 2013b).

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, 2009a). 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, 2009a). 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, 2009a).

Given the application area occurs on the floor and shoreline of a lake, vegetation within the application area is growing in association with a waterbody. Fordyce (2011) found the Lake Goorly flora conforms broadly with Western Australian Wheatbelt (Lyons et al., 2004) (cited in Fordyce, 2011) and continental (Saintilan, 2009) (cited in Fordyce, 2011) trends for saline-wetland vegetation. Fordyce (2011) adds that on the whole the lake-shore vegetation at Lake Goorly is broadly similar to vegetation at salt lake margins throughout the Yarra Yarra region. Given the size of the lake and associated fringing areas (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 (2009a)
 Fordyce (2011)
 Newland (2013b)
 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).

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).

Another desktop land degradation assessment has been undertaken by DAFWA (DAFWA, 2014). DAFWA (2014) states that the mining operations carried out in the lake, do not appear to have caused problems from a land degradation perspective, therefore, the proposed continued progressive land clearing and mining is unlikely to be at variance with Principle (g) for land degradation in the forms of soil erosion and salinity.

The application area may be susceptible to wind erosion once vegetation is removed, particularly on the dune system located on the eastern margin of Lake Goorly. Potential impacts from wind erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

Newland (2013b) states that clearing will be progressive and will only occur prior to imminent works being undertaken. Rehabilitation of cleared areas will occur immediately after active mining is completed and it is safe to do so (Newland, 2013b). Mining of gypsum is undertaken to a depth of between 0.3 and 1 metres, therefore, the resultant landscape resembles a slightly lower profile of the surrounding lake floor. Newland (2013b) notes that from past rehabilitation experience at Lake Goorly, the chenopod - samphire vegetation regrows quickly and the salt lake environment is restored.

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

Methodology DAFWA (2014)
DMP (2010)
Newland (2013b)

(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 Parks and Wildlife managed lands (GIS Database). The nearest conservation area is the Jibberding Nature Reserve, located approximately six 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 Lake Goorly, a large salt lake that is dry for extended periods and holds water only briefly after rain (Newland, 2013b, 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, 2009a).

Lake Goorly has a shallow water table and contains water that is highly saline. According to available databases, groundwater salinity within the application area ranges from 14,000 to in excess of 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). DEC (2009a) noted that high nutrients in the water were indicative of nutrient enrichment from surrounding agricultural lands. Newland (2013b) notes that gypsum mining operations at Lake Goorly are above the watertable and located in areas of desiccated lake bed. 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 (2009a)
Fordyce (2011)
Newland (2013b)
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 (84.47 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, 2013b). The scale of the proposed clearing (84.47 hectares) in relation to the size of Lake Goorly and associated fringing areas (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 (2013b)

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: WC1997/072 (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 Regulation, the Department of Parks and Wildlife and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 3 February 2014 by the Department of Mines and Petroleum inviting submissions from the public. One submission regarding Aboriginal heritage issues was received. A response was sent to the interested party.

Methodology GIS Database:

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

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

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

need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

- X **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

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