



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6657/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Regis Resources Limited

1.3. Property details

Property: Mining Leases 38/237, 38/250, 38/283, 38/292, 38/303, 38/316, 38/317, 38/343, 38/352, 38/354, 38/407, 38/498, 38/499, 38/500, 38/589, 38/802, 38/939, 38/940, 38/943, 38/1091, 38/1092, 38/1249, 38/1250, 38/1251, 38/1257, 38/1258, 38/1259, 38/1260, 38/1261, 38/1262, 38/1263;
Miscellaneous Licences 38/133, 38/182, 38/234, 38/238;
Prospecting Licence 38/3544

Local Government Area: Shire of Laverton

Colloquial name: Duketon Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1,450		Mechanical Removal	Mineral production and associated infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 15 October 2015

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description One Beard vegetation association is located within the application area (Government of Western Australia, 2014; GIS Database):

- 18: Low woodland; mulga (*Acacia aneura*).

The Duketon Project area can be divided into three subproject areas, Garden Well, which is located at the south of the application area, Rosemont, which is located towards the south-west of the application and Moolart Well/Erlistoun, which is located at the north of the application area. Multiple flora surveys have been undertaken over these three separate areas:

Moolart Well/Erlistoun

(Outback Ecology, 2007)

1. Undulating Plains

P1 - Mulga Low Forest A: *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia* were present in groves with an understorey limited to occasional plants including *Psyrax latifolia*, *Eremophila latrobei* ssp. *latrobei*, *E. forrestii* ssp. *forrestii*, *Dianella revoluta* and *Cheilanthes austrotenuifolia*.

P2 - Mulga Open Scrub to Low Forest B over *Eremophila spectabilis* ssp. *brevis* Low Scrub B over *Eragrostis eriopoda* Open Low Grass: Sparse to mid-dense cover of *Acacia aneura* var. *aneura*, *A. aneura* var. *argentea* and *A. aneura* var. *intermedia*. Other shrub species present at lower densities included *Eremophila forrestii* ssp. *forrestii*, *E. youngii* ssp. *youngii* and *Senna artemisioides* ssp. *filifolia*. *Eragrostis eriopoda* dominated the mid-dense to sparse grass layer with *Monachather paradoxus*, *Aristida contorta* and *Thyridolepis multiculmis* also recorded.

P3 - Mulga Open Scrub to Low Forest A over *Eremophila youngii* ssp. *youngii* Dwarf Scrub C over *Eragrostis eriopoda* Open Low Grass: Very sparse to mid-dense cover of tall shrubs to low trees of *Acacia aneura*. Other shrub species present included *Eremophila spectabilis* ssp. *brevis* and *Senna artemisioides* ssp. *filifolia*. A sparse to mid-dense grass layer was present with *Eragrostis eriopoda* dominant. Other grass species included *Aristida contorta*, *Monachather paradoxus* and *Thyridolepis multiculmis*.

P4 - Mulga Open Scrub to Low Forest B over *Eremophila forrestii* ssp. *forrestii* Low Scrub B over *Eragrostis eriopoda* Open Low Grass: *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia* formed a sparse to middense overstorey with a sparse shrub layer dominated by *Eremophila forrestii* ssp. *forrestii*

present. Other shrub species included *Eremophila latrobei* ssp. *latrobei*, *E. spectabilis* ssp. *brevis* and *Ptilotus obovatus*. A sparse grass layer was dominated by *Eragrostis eriopoda* with *Aristida contorta* and *Monachather paradoxus* also present at low densities.

P5 - Mulga Low Woodland B over Mixed Open Low Scrub C over *Eragrostis eriopoda* Low Grass: Sparse overstorey was comprised of *Acacia aneura* variants (*aneura*, *intermedia* and *argentea*) over tall shrubs to low trees of *Acacia ramulosa* var. *linophylla* and *Grevillea nematophylla* ssp. *supraplana*. A very sparse shrub layer was dominated by *Sida calyxhymenia*, *Ptilotus obovatus* and *Eremophila pungens*. Other shrub species recorded included *Solanum lasiophyllum*, *Eremophila ramiflora* and *Maireana georgei*.

P6 - Mulga Open Scrub over *Maireana triptera* Open Dwarf Scrub D over *Sclerolaena* Very Open Herbs: Areas contained a sparse to dense cover of ironstone gravel (with some quartz in the roadside plots). The very sparse (to absent) overstorey contained tall shrubs of *Acacia aneura* var. *aneura* over a very sparse low shrub layer of *Maireana triptera*.

P7 - Mulga Thicket to Low Woodland A over *Triodia basedowii* Mid-dense Hummock Grass: *Acacia aneura* var. *aneura*, *A. aneura* var. *argentea* and *A. aneura* var. *intermedia* dominated the sparse to mid-dense upper storey. Other less common upper storey species included *Eucalyptus* sp. Mulga Rock (K.D. Hill & L.A.S. Johnson KH 2668) and *Grevillea nematophylla* ssp. *supraplana*. A very sparse shrub layer was present at some sites with species including *Eremophila forrestii* ssp. *forrestii*, *E. glabra*, *E. youngii* ssp. *youngii* and *Grevillea sarissa* recorded.

P8 - *Senna artemisioides* ssp. *filifolia* Open Low Scrub B over *Prostanthera wilkieana* Low Heath C: The shrub species *Prostanthera wilkieana* dominated the mid-dense vegetation with *Senna artemisioides* ssp. *filifolia* providing a very sparse upper storey.

P9 - *Melaleuca xerophila* and Mulga Low Woodland to Forest A over *Melaleuca interioris* Heath B: *Melaleuca xerophila*, *Acacia aneura* var. *argentea* and *A. aneura* var. *intermedia* dominated the sparse to mid-dense upper storey with *Melaleuca interioris* providing a mid-dense middle storey (to 1.5m in height). *Eragrostis eriopoda* and *Triodia basedowii* were present at very low densities.

P10 - *Eucalyptus eremicola* Open Tree Mallee over Mulga Open Low Woodland B over *Eragrostis eriopoda* Very Open Low Grass: The sparse upper storey of this vegetation was dominated by the mallee species *Eucalyptus eremicola* and *Acacia aneura* var. *argentea*, *A. aneura* var. *intermedia* and *A. aneura* var. *microcarpa*. A sparse mid storey was provided by *Senna artemisioides* ssp. *filifolia* over *Ptilotus obovatus* with a very sparse under storey of *Eragrostis eriopoda*. *Triodia basedowii* was present at a low density as were the shrub species *Halgania cyanea* and *Eremophila youngii* ssp. *youngii*.

P11 - Mulga Low Woodland B over *Senna* spp Low Scrub B over *Ptilotus obovatus* Open Dwarf Scrub C: Very sparse to sparse upper storey was provided by *Acacia aneura* var. *aneura* and *A. aneura* var. *argentea*. *Ptilotus obovatus* dominated the mid storey, ranging from mid-dense to very sparse in cover. Other shrub species present included *Scaevola spinescens*, *Senna artemisioides* ssp. *x artemisioides*, *Senna* sp. Meekatharra and *Eremophila spectabilis* ssp. *brevis*. *Eragrostis eriopoda* and *Aristida contorta* were present at low densities at some sites.

P12 - Mulga Open Scrub to Low Woodland B over *Eragrostis eriopoda* Low Grass: This association was located on undulating plains with a very sparse to mid-dense cover of ironstone gravel. *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia* provide a very sparse to mid-dense upper storey. A very sparse shrub layer was present at some sites with species including *Scaevola spinescens*, *Ptilotus obovatus*, *Eremophila latrobei* ssp. *latrobei*, *Solanum lasiophyllum* and *Eremophila pungens* (P3) recorded. *Eragrostis eriopoda* cover ranged from mid-dense to dense.

P13 - Mulga Low Woodland B over *Aristida contorta* Open Low Grass: *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia* provided a sparse upper storey while a mid storey was either absent or very sparse and contained *Sida calyxhymenia* and *Ptilotus obovatus*. *Aristida contorta* dominated the lower storey, ranging from very sparse to sparse in cover.

2. Drainage Lines

D1 - Mulga Low Forest A over Mixed Open Scrub to Dwarf Scrub over Mixed Open Low Grasses: This association occurred across drainage lines in the survey area and displayed a mid-dense upper storey of *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia*. Other less common *Acacia* species included *A. craspedocarpa* and *A. ramulosa* var. *linophylla*. Mid-storey shrub species varied in density and diversity across the sites with cover generally being very sparse to sparse. Dominant species included *Eremophila punctata*, *E. spectabilis* ssp. *brevis*, *E. forrestii* ssp. *forrestii*, *E. pungens* (P3) and *Sida calyxhymenia*. A very sparse to mid-dense cover of grasses was recorded with dominant species including *Eragrostis eriopoda*, *Aristida contorta*, *Eriachne pulchella* and *E. flaccida*, the latter occurring in the larger drainage lines.

3. Low Hills

H1 - Mulga Low Woodland B over *Eremophila* and *Hakea* Scrub over *Ptilotus obovatus* Open Dwarf Scrub C: This vegetation association occurred on an area of quartz along the low ridgeline/hill running north-south between the proposed pit and TSF sites at Moolart Well. A sparse cover of *Acacia aneura* var. *intermedia*, *A. aneura* var. *aneura* and *A. aneura* var. *conifera* was recorded over a sparse cover of tall shrubs of *Eremophila scoparia*, *E. oldfieldii* ssp. *angustifolia*, *Hakea preissii* and *Scaevola spinescens*. A very sparse understorey of *Ptilotus obovatus* and *Maireana georgei* was present over a very sparse cover of the grass species *Aristida contorta*, *Eriachne pulchella* and *Enneapogon caerulescens*.

H2 - Mulga Low Woodland B over Mixed Low Scrub A: The sparse over storey was dominated by *Acacia aneura* var. *aneura* and *A. aneura* var. *argentea* while tall shrub species of *Eremophila ramiflora*, *Dodonaea rigida* and *Sida calyxhymenia* provided a sparse mid storey. The Priority Flora species *Baeckea* sp. Melita Station (P4) and *Eremophila pungens* (P3) were both present at low densities.

H3 - Senna species Open Scrub over Ptilotus obovatus Low Heath Cover Enneapogon caerulescens Low Grass: A sparse cover of *Acacia aneura* var. *aneura* and var. *argentea* was recorded over a very sparse cover of *Senna* species. A sparse lower shrub layer was dominated by *Ptilotus obovatus* with *Solanum lasiophyllum* and *Maireana georgei* also present. *Enneapogon caerulescens* cover ranged from mid-dense to sparse with other grass species present at lower densities including *Aristida contorta* and *Eragrostis dielsii*.

H4 - Mulga Open Scrub to Low Woodland B over Eriachne mucronata Open Low Grass to Low Grass: This association was present on low hills with a mid-dense to dense cover of ironstone gravel (and granite in some areas). A sparse over storey was provided by *Acacia aneura* var. *aneura* and *A. aneura* var. *intermedia* with *A. craspedocarpa*, *A. ramulosa* var. *linophylla* and *A. quadrimarginea* occurring in some areas. A very sparse mid storey was present with occasional shrubs of *Eremophila latrobei* ssp. *latrobei*, *E. punctata* and *Senna* sp. Meekatharra. *Baeckea* sp. Melita Station (P4) occurred in a number of sites but was not common. *Eriachne mucronata* dominated the lower storey ranging from very sparse to mid-dense in cover.

H5 - Mulga Low Woodland B over Eremophila punctata Low Scrub B: This association occurred on low hills with a dense cover of ironstone gravel. *Acacia aneura* var. *aneura* dominated the sparse over storey with other *Acacia* species including *A. craspedocarpa* and *A. ramulosa* var. *linophylla* also present in patches. A sparse to middense shrub layer of *Eremophila punctata* was evident. Other shrub species present at lower densities included; *Eremophila latrobei* ssp. *latrobei*, *E. pungens* and *Sida excedentifolia*. The grass layer varied from a very sparse to sparse cover of *Eragrostis eriopoda*, *Eriachne mucronata* or *Aristida contorta*.

H6 - Mulga and Acacia craspedocarpa Scrub over Baeckea sp. Melita Station Low Scrub A: The defining feature of this association was the tall sparse shrub layer of *Baeckea* sp. Melita Station (P4). Fifty plants were recorded in the plot with hundreds of plants surrounding. The population was in good health with seedlings present. A sparse over storey of tall shrubs of *Acacia aneura* var. *aneura*, *A. aneura* var. *intermedia* and *A. craspedocarpa* was present with a very sparse to absent grass layer dominated by *Neurachne minor*, *Eragrostis eriopoda* and *Eriachne mucronata*.

4. Claypan/Drainage Areas

C1 - Maireana pyramidata and Cratystylis subspinescens Heath B over Frankenia ?pauciflora and Halosarcia pergranulata Dwarf Scrub D; and

C2 - Muehlenbeckia florulenta Heath to Low Scrub A: Muehlenbeckia florulenta dominates the vegetation with *Rhagodia* sp. also featuring prominently.

5. Sandplains

S1 - Eucalyptus kingsmillii ssp. kingsmillii Open Tree Mallee over Triodia basedowii Mid-dense Hummock Grass: *Eucalyptus kingsmillii* ssp. *kingsmillii* dominates the sparse upper storey with *Acacia aneura* variants also occurring in some areas as tall shrubs with a very sparse cover. The lower storey was dominated by *Triodia basedowii* (mid dense cover) with *Leptosema chambersii* also featuring at the majority of sites. Sections of this vegetation association appear to have been burnt within the last two to three years.

S2 - Eucalyptus gongylocarpa Open Low Woodland A over Triodia basedowii Mid-dense Hummock Grass: A very sparse upper storey of *Eucalyptus gongylocarpa* was present with some areas containing this species at a sparse to mid-dense cover. A sparse to very sparse mid storey of *Acacia* species, including *Acacia prainii*, *A. abrupta*, *A. kempeana* and *A. jennerae* was present across all sites. Other shrub species included *Grevillea juncifolia*, *Aluta maisonneuvei* ssp. *auriculata*, *Newxastelia hexarrhena*, *Olearia incana* and *Leptosema chambersii*. *Triodia basedowii* dominated the mid-dense lower storey.

S3 - Eucalyptus eremicola Open Tree Mallee over Mixed Low Scrub B over Triodia basedowii Mid-dense Hummock Grass: A sparse upper storey cover was provided by the mallee species *Eucalyptus eremicola*. A sparse mid storey quite distinct from other surrounding vegetation was present with species including *Hakea minima*, *Acacia* sp. (BJ143), *Aluta maisonneuvei* ssp. *auriculata*, *Halgania erecta* and *Enekbatus eremaeus*. *Triodia basedowii* dominated the mid-dense lower storey. Sections of this association had been burnt within the last two to three years.

S4 - Eucalyptus erimicola and Eucalyptus sp. Mulga Rock (K.D. Hill & L.A.S. Johnson KH 2668) Open Tree Mallee over Triodia basedowii Mid-dense Hummock Grass. A sparse upper storey is dominated by the mallee species *Eucalyptus erimicola* and *Eucalyptus* sp. Mulga Rock (K.D. Hill & L.A.S. Johnson KH 2668) while a sparse mid storey is provided by *Acacia prainii*, *Grevillea nematophylla* ssp. *supraplana* and *Senna artemisioides* ssp. *filifolia*. *Triodia basedowii* dominates the dense lower storey.

Garden Well

(Mattiske Consulting, 2010)

A1: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* over *Acacia ramulosa* var. *linophylla*, *Acacia tetragonophylla*, *Eremophila pungens* (P4), *Eremophila punctata* and *Eremophila forrestii* subsp. *forrestii* on red-orange sandy loams on flats and slopes;

A2: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* and *Grevillea berryana* over *Acacia ramulosa* var. *ramulosa*, *Acacia tetragonophylla* and mixed *Eremophila* spp. over *Ptilotus obovatus*, *Eragrostis eriopoda* and *Eriachne mucronata* on orange sandy/clay-loams on flats;

A3: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana* and occasional *Eucalyptus horistes* over *Acacia oswaldii*, *Acacia victoriae* and *Senna artemisioides* subsp. *filifolia* over *Ptilotus obovatus*, *Triodia scariosa* and *Enneapogon caerulescens* on red-orange sandy-loams with calcrete and quartz pebbles on flats;

A4: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana* and occasional *Eucalyptus horistes* and *Grevillea nematophylla* subsp. *supraplana* over *Acacia tetragonophylla*, *Acacia aptaneura* and *Acacia victoriae* with *Senna artemisioides* subsp. *filifolia* and *Eremophila pungens* (P4) over *Ptilotus obovatus* and mixed Poaceae spp. on orange sandy-loams on flats and minor drainage lines;

A5: Low open woodland to open shrubland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana*, *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *filifolia* over mixed annual herbs on orange sandy-loams in minor drainage lines;

A6: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia aptaneura*, *Acacia ayersiana* and *Grevillea berryana* over *Eremophila punctata* and *Eremophila latrobei* subsp. *latrobei* over *Eriachne mucronata* on orange sandy-loams with numerous chert outcropping on slopes and ridges;

A7: Low open woodland of *Acacia aneura* var. *aneura* over *Acacia craspedocarpa*, *Acacia tetragonophylla*, *Santalum spicatum*, *Eremophila georgei* and *Senna artemisioides* subsp. *filifolia* over *Sida calyxhymenia*, *Ptilotus obovatus* and *Eriachne mucronata* on orange sandy loams in minor drainage lines;

A8: Low open woodland to open shrubland of *Acacia ayersiana*, *Acacia aneura* var. *aneura* and *Acacia aptaneura* with *Acacia tetragonophylla* over *Eremophila latrobei* subsp. *filiformis*, *Ptilotus obovatus*, *Dianella revoluta* and *Eragrostis eriopoda* on orange sandy-loams on flats;

A9: Low open woodland of *Acacia aneura* var. *aneura* and *Acacia ayersiana* with occasional *Grevillea berryana* over *Acacia tetragonophylla*, *Acacia craspedocarpa* and *Eremophila pungens* (P4) over *Ptilotus obovatus*, *Sida calyxhymenia* and Poaceae spp. on orange sandy-loams on flats;

A10: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with occasional *Eucalyptus horistes*, *Grevillea berryana* and *Hakea lorea* over *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *x artemisioides* and *Senna artemisioides* subsp. *filifolia* over *Ptilotus obovatus*, *Sida calyxhymenia* and Poaceae spp. on orange sandy/clay-loams in drainage lines; and

C1: Low open Chenopod shrubland of *Maireana pyramidata* and *Cratystylis subspinescens* with emergent *Acacia aneura* var. *aneura* and *Hakea preissii* over *Frankenia setosa*, *Maireana georgei*, *Maireana planifolia*, *Maireana tomentosa* and *Sclerolaena eriacantha* on orange clay-loams on flats.

Rosemount Gold

(Mattiske Consulting, 2012)

A1: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* over *Acacia ramulosa* var. *linophylla*, *Acacia tetragonophylla*, *Eremophila pungens* (P4), *Eremophila punctata* and *Eremophila forrestii* subsp. *forrestii* on red-orange sandy loams on flats and slopes.

A2: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* and *Grevillea berryana* over *Acacia ramulosa* var. *ramulosa*, *Acacia tetragonophylla* and mixed *Eremophila* spp. over *Ptilotus obovatus*, *Eragrostis eriopoda* and *Eriachne mucronata* on orange sandy/clay-loams on flats.

A5: Low open woodland to open shrubland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana*, *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *filifolia* over mixed annual herbs on orange sandy-loams in minor drainage lines.

A11: Open to semi-closed shrubland of *Acacia incurvaneura* over *Eremophila pungens* (P4) and *Hibiscus burtonii* over *Ptilotus drummondii* and mixed grasses on flats with red clay soil.

A12: Open shrubland of *Acacia incurvaneura* and *Acacia mulganeura* over *Acacia tetragonophylla* and *Eremophila oldfieldii* over *Ptilotus obovatus*, *Hibiscus burtonii* and *Solanum lasiophyllum* over mixed grasses on flats to lower slopes with red gravely clay soil and quartz pebbles.

A13: Semi-closed to open shrubland of *Acacia mulganeura*, *Acacia incurvaneura*, *Acacia tetragonophylla* and *Acacia craspedocarpa* over *Ptilotus obovatus*, *Hibiscus burtonii* and *Solanum lasiophyllum* on flats with red clay soil and quartz pebbles.

A14: Open to semi-closed shrubland of *Acacia incurvaneura* and occasional *Acacia mulganeura*, *Acacia quadrimarginea*, *Acacia pteraneura* and *Acacia tetragonophylla* over *Hibiscus burtonii* and *Ptilotus obovatus* over *Solanum lasiophyllum*, *Ptilotus drummondii*, *Enchylaena tomentosa* and mixed grasses on flats with clay soil.

A15: Open to semi-closed shrubland of *Acacia incurvaneura*, *Acacia mulganeura* and *Acacia tetragonophylla* over *Eremophila oldfieldii* over *Ptilotus obovatus*, *Hibiscus burtonii* and *Solanum lasiophyllum* over mixed grasses on flats with red clay soils and occasional quartz pebbles.

A15a: Degraded A15 vegetation community.

A16: Closed to open shrubland of *Acacia incurvaneura*, *Acacia burkittii*, *Acacia tetragonophylla* and *Acacia craspedocarpa* over *Senna artemisioides* subsp. *x artemisioides* over *Ptilotus obovatus* and *Hibiscus burtonii* over *Cheilanthes sieberi* subsp. *sieberi* and mixed grasses on minor creek lines with red clay soils.

A17: Closed to semi-open shrubland of *Acacia incurvaneura*, *Acacia pteraneura*, *Acacia craspedocarpa* and *Acacia tetragonophylla* over *Hibiscus burtonii* over *Sida* sp. dark green fruits (S. Van Leeuwen 2260), *Solanum lasiophyllum* and *Abutilon cryptopetalum* over *Cheilanthes sieberi* subsp. *sieberi* and mixed grasses on minor creek lines with red clay soil.

A18: Closed shrubland of *Acacia incurvaneura*, *Acacia mulganeura*, *Acacia craspedocarpa* and *Acacia tetragonophylla* over *Eremophila latrobei* subsp. *latrobei* and *Psyrax suaveolens* over *Grevillea deflexa* and *Hibiscus burtonii* over *Sida fibulifera* and mixed grasses on minor creek lines with red clay soil.

A19: Open shrubland of *Acacia burkittii* over *Eremophila oldfieldii* and *Senna artemisioides* subsp. *filiformis* over *Ptilotus obovatus* over mixed grasses on flats with red clay soil and quartz pebbles.

A20: Open to semi-closed shrubland of *Acacia incurvaneura* and *Acacia quadrimarginea* over *Ptilotus obovatus*, *Baeckea* sp. Melita Station (H. Pringle 2738) and *Ptilotus schwartzii* over mixed grasses on red clay loams with numerous granitic outcropping on slopes and ridges.

C1: Low open Chenopod shrubland of *Maireana pyramidata* and *Cratystylis subspinescens* with emergent *Acacia aneura* var. *aneura* and *Hakea preissii* over *Frankenia setosa*, *Maireana georgei*, *Maireana planifolia*, *Maireana tomentosa* and *Sclerolaena eriantha* on orange clayloams on flats.

C2: Very open Chenopod shrubland of *Maireana pyramidata* over *Maireana triptera*, *Sclerolaena eriantha*, *Solanum lasiophyllum*, *Frankenia georgei* and mixed grasses with occasional emergent *Acacia ?cuthbertsonii*, *Hakea preissii* and *Eremophila oldfieldii* on flats with red clay soil and quartz pebbles.

C3: Open Chenopod shrubland of *Tecticornia pergranulata*, *Maireana pyramidata*, *Frankenia georgei* and *Sclerolaena fusiformis* on flats with red clay soil and quartz pebbles.

C4: Open Chenopod shrubland of *Tecticornia pergranulata*, *Maireana triptera*, *Maireana pyramidata*, *Mirbelia rhagodioides*, *Sclerolaena eriantha* and mixed grasses with occasional thickets of *Acacia incurvaneura*, *Acacia burkittii*, *Acacia tetragonophylla*, *Exocarpos aphyllus* and/or *Senna artemisioides* subsp. *filifolia*.

Clearing Description	Duketon Project Regis Resources Limited (Regis Resources) proposes to clear up to 3,914 hectares of native vegetation within a total boundary of approximately 7,862 hectares for the purpose of mineral production and associated infrastructure. However, only 1,450 has been approved to clear. The project is located approximately 110 kilometres north of Laverton, in the Shire of Laverton.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994). To Completely degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was determined by Outback Ecology (2007) and Mattiske Consulting (2010; 2012).

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 is located within the East Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The East Murchison subregion is characterised by internal drainage, extensive areas of elevated red desert sandplains with minimal dune development, salt lake systems associated with the occluded paleodrainage system, broad plains of red-brown soils and breakaway complexes, as well as red sandplains (CALM, 2002). Vegetation is dominated by Mulga woodlands which are often rich in ephemerals; hummock grasslands, saltbush shrublands and *Halosarcia* shrublands (CALM, 2002).

The objective of this application is to consolidate five existing clearing permits (CPS 2799/4, CPS 2801/2, CPS 4228/3, CPS 4321/2 and CPS 5127/3) held by Regis Resources, as well as apply for an additional 95 hectares of clearing not currently covered by a clearing permit. Existing live permits are to be surrendered and future clearing is to be conducted under CPS 6657/1. Based on reported annual clearing for existing live permits within the application area, a total of 2,497.84 hectares of native vegetation has been cleared out of a possible 3,813 hectares approved to be cleared. The current application to clear up to 1,450 hectares will result in an increase in the amount of native vegetation proposed to be cleared within the local area.

The application area is covered by three main surveys; Outback Ecology (2007) and Mattiske Consulting (2010; 2012), which were undertaken for the current live permits. The vegetation communities and landforms

identified within the application were found to be widespread in the region (Outback Ecology, 2007; Mattiske Consulting, 2010; 2012). None of the vegetation communities identified within the application represent a Threatened or Priority Ecological Community (Outback Ecology, 2007; Mattiske Consulting, 2010; 2012). A search of available databases (GIS Database) shows there to be no Threatened or Priority Ecological Communities within the application area.

No Threatened flora species have been recorded in the application area (Outback Ecology, 2007; Mattiske Consulting, 2010; 2012; GIS Database). A total of five Priority flora species have been recorded within the application area, however none of these species are restricted to the application area and have been found in larger populations in the surrounding region (Outback Ecology, 2007; Mattiske Consulting, 2010; 2012).

According to previous clearing permit assessments, several weed species are located within the application area. A weed management condition is recommended to minimise the potential impacts from the introduction and spread of weeds.

According to NatureMap (DPaW, 2015), there are 89 fauna species records within 20 kilometres of the application area, consisting of 47 bird, 29 reptile, 7 mammal and 6 invertebrate species. This is considered to represent low fauna diversity. Terrestrial Ecosystems (2010; 2012) has undertaken fauna surveys over some of the application area, and notes that fauna diversity appears relatively lower compared within other fauna surveys in the region.

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

Methodology CALM (2002)
DPaW (2015)
Mattiske Consulting (2010)
Mattiske Consulting (2012)
Outback Ecology (2007)
Terrestrial Ecosystems (2010)
Terrestrial Ecosystems (2012)
GIS Database:
- IBRA WA (Regions - Subregions)
- Threatened Ecological Sites Buffered

(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 number of fauna surveys have been undertaken over various parts of the application, including; Coffey Environments (2008) and Terrestrial Ecosystems (2010; 2012).

According to Terrestrial Ecosystems (2010; 2012), the main fauna habitat type around the Garden Well project area is open mulga woodland over mixed scattered shrubs. Coffey Environments (2008) mapped three fauna habitat types across the Duketon Gold project area, which area:

- Mulga woodland with a sparse understorey of grasses on a sandy-clay substrate;
- Spinifex with an overstorey of shrubs and small trees on a sandy substrate; and
- Spinifex with an overstorey of Eucalypts and shrubs.

Based on previous clearing permit assessments, the most common habitat type within the application can be summarised as Mulga woodland with a sparse understorey of grasses on a sandy-clay substrate.

Based on preferred habitat types, the following additional conservation significant fauna species may potentially occur within the application area (Terrestrial Ecosystems, 2010; 2012):

- Peregrine Falcon (*Falco peregrines*) – Schedule 4 under WC Act
- Australian Bustard (*Ardeotis australis*) – DPaW Priority 4
- Slender-billed Thornbill (*Acanthiza iredalei iredalei*) – Vulnerable under EPBC Act
- Princess Parrot (*Polytelis alexandrae*) – Vulnerable under EPBC Act
- Fork-tailed Swift (*Apus pacificus*) – Migratory under EPBC Act, Schedule 3 under WC Act.

These six species are highly mobile and unlikely to be significantly impacted by the proposed clearing.

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

Methodology Australasian Ecological Services (2015)
Botanica (2010)
DEC (2009)
DEC (2012a)
DEC (2012b)

DEC (2012c)
DEC (2012d)
DPaW (2015)
Western Areas (2015)

(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 datasets, there are no known records of Threatened flora within the application area (GIS Database).

None of the flora surveys undertaken over the application identified any Threatened flora species (Outback Ecology, 2007; Mattiske Consulting, 2010; 2012).

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

Methodology Mattiske Consulting (2010)
Mattiske Consulting (2012)
Outback Ecology (2007)
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 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 located approximately 211 kilometres west of the application area.

No TECs were identified by Outback Ecology (2007) or Mattiske Consulting (2010; 2012).

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

Methodology Mattiske Consulting (2010)
Mattiske Consulting (2012)
Outback Ecology (2007)
GIS Database:
- Threatened Ecological Sites Buffered

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

Comments Proposal is not at variance to this Principle

The application area falls within the Murchison IBRA bioregion (GIS Database) in which approximately 99.73% of pre-European vegetation remains (Government of Western Australia, 2014; GIS Database). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

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

- 18: Low woodland; mulga (*Acacia aneura*).

Approximately 99% of vegetation association 18 remains at a state level and bioregion level (Government of Western Australia, 2014). Therefore, the vegetation under application is not a remnant of vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Lands
IBRA Bioregion - Murchison	28,120,586	28,044,823	~99	Least Concern	7.69
Beard vegetation associations - State					
18	19,892,304	19,843,727	~99	Least Concern	6.29
Beard vegetation associations - Bioregion					
18	12,403,172	12,363,252	~99	Least Concern	4.96

* Government of Western Australia (2014)

** 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)
Government of Western Australia (2014)
GIS Database:
- IBRA WA (Regions - Subregions)
- 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

Available datasets show the application area is intersected by several minor, ephemeral watercourses (GIS Database).

Vegetation surveys undertaken by Outback Ecology (2007) and Matiske Consulting (2010; 2012) recorded vegetation growing in association with minor drainage lines. It was noted in these surveys that the vegetation types recorded are common and widespread across the Murchison region. The proposed clearing is not likely to significantly impact on riparian vegetation. Any potential impacts to riparian vegetation may be minimised through the implementation of a watercourse management condition.

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

Methodology Matiske Consulting (2010)
Matiske Consulting (2012)
Outback Ecology (2007)
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 may be at variance to this Principle

According to available databases, the application area intersects with 8 different land systems:

- Hootanui land system is characterised by breakaways, hills and ridges with extensive saline gravelly and stony lower plains (Pringle et al, 1994). Narrow drainage tracts and breakaway footslopes are susceptible to water erosion in areas where perennial shrub cover is substantially reduced or is the soil surface is disturbed.

- Jundee land system is characterised by hardplains with ironstone gravel mantles, supporting mulga shrublands (Pringle et al, 1994).

- Nuveb land system is characterised by gently undulating stony plains, minor low rises and drainage floors (Pringle et al, 1994). This land system is moderately susceptible to erosion in drainage zones and where there is disturbance to the surface mantle on saline stony plains (Pringle et al, 1994).

- Felix land system is characterised by plains with quartz mantles, supporting shrublands locally with wanderrie grasses (Pringle et al, 1994). Stone mantles provide effective protection against erosion.

- Sheer land system is characterised by gravelly alluvial plains with halophytic shrublands (Pringle et al, 1994). The sheer land system is generally not susceptible to erosion, partly due to protective stone and gravel mantles (Pringle et al, 1994).

- Violet Land System is characterised by extensive, gently undulating to level plains and low rises with mantles

of ironstone pebbles and level to very gently inclined plains subject to sheet flow within mantles of fine ironstone gravel (Pringle et al, 1994). Abundant mantles provide effective protection against soil erosion over most of the land system, except where the soil surface has been disturbed in which case soil becomes moderately susceptible to water erosion (Pringle et al, 1994).

- Ararak land system is characterised by broad plains with mantles of ironstone gravel supporting mulga shrublands with wanderrie grasses (Pringle et al, 1994). The land system comprises extensive level to gently undulating plains subject to very diffuse sheet flow, more concentrated flow zones, isolated rises and higher plains with pebble mantles (Pringle et al, 1994). As a result of low slopes, protective soil mantles and very diffuse sheet flow, this land system is generally not susceptible to soil erosion (Pringle et al, 1994).

- Bevon land system is characterised by irregular low ironstone hills with stony lower slopes supporting Mulga shrublands (Pringle et al, 1994). Given the flat topography and stony mantles for these areas, there is likely to be a low risk of erosion for these areas (Pringle et al, 1994).

The proposed clearing of 1,450 hectares for mineral production and associated infrastructure has the potential to cause soil erosion by breaking protective stony mantles and exposing underlying soils that may be susceptible to erosion. Potential impacts from soil erosion 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 Pringle et al (1994)

(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 is not located within any Department of Parks and Wildlife (DPaW) managed reserves or other conservation areas (GIS Database).

The nearest conservation area is De La Poer Range Nature Reserve located approximately 20 kilometres north-east of the application area. Given the distance between the application area and De La Poer Range Nature Reserve, the proposed clearing is not likely to impact on a conservation area.

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

Methodology GIS Database:
- DPaW Tenure

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

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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Laverton Water Reserve, which is approximately 60 kilometres to the south (GIS Database).

The application area is located within an arid environment with an average annual rainfall of 236.7 millimetres and experiences mean annual evaporation of approximately 3,400 millimetres (CALM, 2002; BoM, 2015). Although there are a number of minor ephemeral watercourses located in the application area, it is likely these drainage lines would only flow for short periods following significant rainfall events (Outback Ecology, 2007). Considering there are no permanent watercourses within the application area, the proposed clearing is unlikely to impact on surface water quality.

The groundwater salinity within the application area is approximately 1,000 to 3,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be brackish. Given the low rainfall and high evaporation rate, the proposed clearing is not likely to significantly increase groundwater recharge which could otherwise lead to a rise in groundwater levels.

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

Methodology BoM (2015)
CALM (2002)
Outback Ecology (2007)
GIS Database:
- Groundwater Salinity, Statewide
- Public Drinking Water Source Area (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 experiences an arid climate with an average annual rainfall of 236.7 millimetres recorded at Carnegie approximately 200 kilometres north-east of the application area (BoM, 2015; CALM, 2002). Mean annual evaporation rates in the application area are approximately 3,400 millimetres (GIS Database). Given these climatic conditions, surface water is unlikely to persist in the proposed permit boundary for extended periods of time.

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

Methodology BoM (2015)
CALM (2002)
GIS Database:
- Evapotation Isopleths

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 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*.

There are no registered Aboriginal Sites of Significance within the application area (DAA, 2015). 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 Water, and the Department of Parks and Wildlife, 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 31 August 2015 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the application.

Methodology DAA (2015)

4. References

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- Mattiske Consulting (2010) Flora and Vegetation Survey of Garden Well Mine and Infrastructure Areas. Prepared for Regis Resources Limited, December 2010.
- Mattiske Consulting (2012) Flora and Vegetation Survey of Rosemont Gold Project Tenements, Haul Road Corridor and Slurry Pipeline. Unpublished report prepared for Regis Resources Limited.
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- Terrestrial Ecosystems (2010) Level 2 Fauna Risk Assessment for the Garden Well Project Area. Prepared for Regis Resources Limited, December 2010.
- Terrestrial Ecosystems (2012) Level 1 Fauna Risk Assessment for Two Waste Dumps either side of the proposed Rosemont Project Area (G38/29, G38/30, G38/31, G38/32) and a Slurry Pipeline from the Rosemont mine to the Garden Well processing plant (L38/219). Unpublished report prepared for Regis Resources Limited.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of the <i>Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T	Threatened species: Specially protected under the <i>Wildlife Conservation Act 1950</i> , listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora). Threatened Fauna and Flora are further recognised by DPaW according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo <i>Calyptorhynchus latirostris</i> is specially protected under the <i>Wildlife Conservation Act 1950</i> as a threatened species with a ranking of Endangered. <u>Rankings:</u> CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild. EN: Endangered - considered to be facing a very high risk of extinction in the wild. VU: Vulnerable - considered to be facing a high risk of extinction in the wild.
X	Presumed Extinct species: Specially protected under the <i>Wildlife Conservation Act 1950</i> , listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).
IA	Migratory birds protected under an international agreement: Specially protected under the <i>Wildlife Conservation Act 1950</i> , listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice. Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.
S	Other specially protected fauna: Specially protected under the <i>Wildlife Conservation Act 1950</i> , listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.
P1	Priority One - Poorly-known species: Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
P2	Priority Two - Poorly-known species: Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and

appear to be under threat from known threatening processes.

P3

Priority Three - Poorly-known species:

Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

P4

Priority Four - Rare, Near Threatened and other species in need of monitoring:

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

P5

Priority Five - Conservation Dependent species:

Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.