Landform / Geology	Vegetation Code	Description	Total Area (ha) (Study Area)	% of Study Area	Area (ha) within the Disturbance Footprint	% within the Dist. Ftprnt.	Area (ha) within the Development Envelope	% within the Dev. Env.
Sandplain Landforms	SAMA	Sandplain, Mallee, Acacia species Spinifex Shrubland	13.27	0.24%	0.00	0.00%	0.00	0.00%
Sandplain Landforms	SAWS	Sandplain, Acacia species Spinifex Shrubland	11.92	0.22%	0.00	0.00%	0.00	0.00%
Basalt geology (Fresh Rock)	BaMAS	Basalt, mixed Acacia species Shrubland Complex	182.92	3.37%	0.16	0.09%	0.33	0.18%
Basalt geology (Fresh Rock)	BaAdS	Basalt, Acacia doreta long phyllode form Shrubland (component of the BaMAS complex)	19.38	0.36%	0.25	1.28%	0.86	4.46%
Archaean granite geology	BrCP	Breakaway Chenopod Plain Complex	12.23	0.23%	0.27	2.24%	0.41	3.36%
Colluvial and Alluvial landforms	DRES	Drainage Line Eucalypt Woodland	50.46	0.93%	1.67	3.30%	3.79	7.51%
Archaean granite geology	GrMS	Granitic Mulga Shrubland	990.02	18.26%	33.46	3.38%	35.19	3.55%
Sandplain Landforms	SAMU	Sandplain Mulga Spinifex Shrubland	172.04	3.17%	8.22	4.78%	16.16	9.39%
Basalt geology (Fresh Rock)	BaAxS	Basalt, Acacia aff. xanthocarpa Shrubland (component of the BaMAS complex)	83.24	1.54%	4.46	5.36%	9.73	11.69%
Colluvial and Alluvial landforms	GRMU	Groved Mulga Woodland	65.21	1.20%	3.56	5.46%	5.51	8.45%
Colluvial and Alluvial landforms	DRMS	Drainage Line Mulga Shrubland	381.54	7.04%	22.41	5.87%	37.67	9.87%
Limonitic Landforms	SILS	Stony Ironstone Low Shrubland	27.17	0.50%	1.82	6.69%	2.37	8.72%
Archaean granite geology	BrX-P	Archaean granite geology	30.79	0.57%	2.12	6.89%	2.85	9.27%
Sandplain Landforms	WABS - SAMU Mosaic Complex	Mosaic of Wanderrie Bank Grassy Shrublands / Sandplain Mulga Spinifex Shrubland	153.89	2.84%	14.65	9.52%	20.57	13.36%



Landform / Geology	Vegetation Code	Description	Total Area (ha) (Study Area)	% of Study Area	Area (ha) within the Disturbance Footprint	% within the Dist. Ftprnt.	Area (ha) within the Development Envelope	% within the Dev. Env.
Archaean granite geology	SAES	Stony Acacia Eremophila Shrubland	484.25	8.93%	55.76	11.51%	80.76	16.68%
Sandplain Landforms	WABS	Wanderrie Bank Grassy Shrublands	182.23	3.36%	27.19	14.92%	36.22	19.88%
Colluvial and Alluvial landforms	SMS	Stony Mulga Shrubland	763.84	14.09%	116.69	15.28%	186.25	24.38%
Colluvial and Alluvial landforms	HPMS	Hardpan Mulga Shrubland	323.35	5.96%	50.75	15.69%	102.73	31.77%
Carbonate Soils, derived from Weathered Basalt	EGPW	Weathered Basalt, Eucalyptus gypsophila - Eremophila pantonii Woodland	11.92	0.22%	2.51	21.07%	5.16	43.26%
Limonitic Landforms	USBS	Upland Small Bluebush Shrubland	92.93	1.71%	27.78	29.90%	32.67	35.15%
Carbonate Soils, derived from Weathered Basalt	GHPS	Weathered Basalt, Hakea leucoptera subsp. sericipes - Eremophila pantonii Shrubland	233.19	4.30%	87.84	37.67%	107.44	46.07%
Carbonate Soils, derived from Weathered Basalt	SSS	Stony Senna Shrubland	127.71	2.36%	49.56	38.81%	54.64	42.79%
Limonitic Landforms	SIMS	Stony Ironstone Mulga Shrubland	412.28	7.60%	162.00	39.29%	254.86	61.82%
Colluvial and Alluvial landforms	MMS	Mulga over Maireana triptera Shrubland	329.99	6.09%	199.56	60.48%	259.82	78.74%
Colluvial and Alluvial landforms	HPMS THOMA	Hardpan Mulga Shrubland with Acacia thoma co-dominant	3.02	0.06%	3.02	100.00%	3.02	100.00%
Ponded Water	Ponded Water	Ponded Water within DRMS at MKO	1.50	0.03%	0.00	0.00%	0.00	0.00%
Disturbed	Disturbed	Disturbed	27.00	0.50%	0.00	0.00%	0.00	0.00%
			5,422.09		875.71		1,259.00	



## **3.12.** Impact Assessment – Priority Ecological Community

### **Violet Range PEC**

The MKS Proposal Study Area occupies 3,248.5 ha (16.87%) of the Violet Range (Perseverance Greenstone Belt) vegetation complexes (banded ironstone formation) P1 Priority Ecological Community. The MKS proposed Disturbance Envelope (inclusive of a buffer around the Disturbance Footprint) occupies 1,009.4 ha (5.24%) of the 19,256.2 ha of the PEC while the MKS Disturbance Footprint impacts on 724.4 ha (3.76%) of the PEC as currently mapped (Figure 11).

Minimal historical impacts to the Violet Ranges PEC have occurred to date with clearing for pastoral tracks and fences as well as historical mining activities at the abandoned Bellevue site on the north-shore of Lake Miranda being the major contributors. The current Cosmos Nickel Mine lies outside the boundary of the Violet Ranges PEC.

It is clear, however, from field investigations conducted in late 2016 as well as historically between Leinster and Mt Keith, that the definition of the Violet Ranges PEC as well as its extent of occupancy and boundaries is in need of review. The majority of the geology within the Violet Ranges PEC is basalt and gabbro and some granite with only minor Banded Ironstone Formation (BIF), chert and quartz outcrops present with associated tertiary laterite capping present.

In the vicinity of the MKS Proposal Study Area, the vegetation associations associated with the Mt Keith Perseverance fault line are constrained within the boundaries of the Violet Ranges Priority Ecological Community. However, while narrow in an east-west orientation, these landforms extend beyond the limits of the PEC as currently drawn. These additional areas extend in a discontinuous fashion both northward (north of the Mt Keith nickel mine) and southward (to the Leinster nickel mine) directions for an overall inclusive length of approximately 82 km. The Violet Ranges PEC represents around 40 % of this overall range and the limits of the landforms and associated vegetation units within the PEC are therefore inaccurate.

A depiction of areas with similar landform and geology to components of the Violet Range PEC, as well as associated vegetation associations outside the current PEC boundary, with the current PEC shown, is presented in Figure 11. The areas of potential similarity to the Violet Range PEC occupy an area of approximately 18,288 ha, an area almost equivalent to that of the currently mapped PEC.





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The regional assessment of the flora and vegetation of the Perseverance Greenstone Belt conducted by Meissner and Wright (2010) extend over 6.6 km within the MKS Proposal Study Area and an overall length of 17.5 km within the Perseverance Greenstone Belt. They are located north of Lake Miranda and south of the Mt Keith nickel mine. The quadrats do not extend to the areas being suggested as worthy of consideration for inclusion in the expanded PEC (Figure 12).





The definition and the area of occupancy the Violet Ranges PEC should therefore be reviewed to incorporate additional adjacent areas of similar basalt geology and associated vegetation types that currently lie within the Mt Keith - Perseverance fault line but outside the current PEC boundaries. This task lies outside the scope of this assessment and is not required to establish relatively low impact on the PEC.

Given the above, and if the expanded area was to be considered as representing similar vegetation associations aligned with the intent of the Violet Ranges PEC, then the proportional impact of the MKS project on the PEC would be approximately halved to around 2%. However, the cumulative impacts of both the Leinster and Mt Keith Nickel mines would have to be taken into consideration. This broadened analysis, incorporating a validation of the assertion that the



area of the PEC could be increased, was not part of this scope of work and has not been undertaken at this stage.

## **3.13.** Statistical Validation of Vegetation Associations

The PATN statistical analysis, with interrogation and explanation of outputs, supports the majority of Vegetation Associations described within the MKS Proposal Study Area. Ordination of the MKS quadrat and Releve data returned a stress value of 0.2463, which is considered high, and is due to complexity of vegetation within a relatively small area. This stress is higher than the preferred value of 0.2000. This reflects the level of complexity of the vegetation units within the Proposal Study Area and demonstrates a comprehensive level of survey. The vast majority of quadrats grouped well with one outlier Releve (a disturbed site) containing only two species (Figure 13).





Classification produced a dendrogram (Figure 14) containing groupings of most similar quadrats into branches typically denoting fine-scale local vegetation units.

In preparing data for analysis, the following was undertaken:

- Weeds and annuals were excluded.
- Singletons (taxa only occurring at one site) were excluded.
- Indeterminate species were excluded to avoid false-grouping. E.g. two *Maireana* sp. Indet. specimens may or may not be the same taxon.



• Mulga varieties within the analysis were treated as per Maslin and Reid (2012). Putative hybrids were lumped into the taxa that they were most related to (the first element of a hybrid listing).

Some notable 'lumpings' of taxa were:

- Eriachne mucronata forms high number of records did not specify which form.
- *Ptilotus obovatus* forms (Typical Goldfields form vs. Upright form) a high number of records did not specify which form.
- Scaevola spinescens forms high number of records did not specify which form.
- *Eremophila spectabilis* (no subsp.), 1 record, merged into *Eremophila spectabilis* subsp. *brevis*, which is the form present in this region.
- *Maireana planifolia* (typical), 1 record, merged into *Maireana planifolia* (long leaf form).
- *Sida fibulifera* and *Sida* sp. verrucose glands (F.H. Mollemans 2423) these were often confused during fieldwork (due to poor plant material and dry seasonal conditions) and could not be separated in the data.



Figure 14. Dendrogram showing similarity/dissimilarity of floral composition of the MKS Proposal Study Area.





Comments on the results of the PATN analysis is presented in Table 12.

Unit	PATN Grouping	Comments
SIMS	Poor	Six sites grouped well into a Minor Branch mostly composed of the DPaW sites. Four sites grouped within a branch related to the secondary GRMS grouping. The remaining 17 sites dispersed throughout the dendrogram. This shows that the SIMS community as mapped is heterogeneous and variable.
MMS	Poor	MMS sites split into two locations on the dendrogram. Four sites formed a Minor Branch, allied to the DRMS branch. The other five sites occurred within the Chenopod Major Branch but mostly separate from each other. This shows that the MMS community, a colluvial community downslope of SIMS, is heterogeneous and variable.
DRMS	Excellent	Three of five sites grouped together within one Minor Sub Branch. The two other sites are validly DRMS but moved elsewhere due to sharing some species of nearby vegetation (commonly occurs with long narrow drainage polygons).
DRES	Perfect	All three sites grouped perfectly as one of the 14 Major Branches.
SAMU	Excellent	All five sites grouped together within one Minor Sub Branch.
SAMA	-	One quadrat. Paired with the single SAWS site as a related branch to SAMU grouping. SAMA, SAWS and SAMU communities are closely allied.
SAWS	-	One quadrat. Paired with the single SAMA site as a related branch to SAMU grouping. SAMA, SAWS and SAMU communities are closely allied.
SAES	Poor	No coherent grouping within the analysis. But retained as a mapped unit due to dominance of <i>Eremophila galeata</i> common to SAES sites. High species variability dispersed SAES sites across multiple dendrogram branches. Appears that the SAES community, which is readily noted in the field, is strongly influenced by adjacent communities, with species leakage across margins, making statistical validation of the community difficult.
BaAbS	Excellent	Three of four sites grouped together within a separate Minor Sub Branch. The remaining site is an extreme outlier (forming a Major Branch on its own) that can be validly lumped with other BaAbS sites due to <i>Acacia doreta</i> long phyllode form being the most dominant species. These sites are strongly influenced by the underlying basalt geology.
BaAdS	Excellent	Three of four sites grouped together within one Minor Sub Branch due to presence of <i>Acacia doreta</i> long phyllode form. Related to both the BaAbS and BaAxS branches. These sites are strongly influenced by the underlying basalt geology.
BaAxS	Good	Four of eight sites fell within a separate Minor Sub Branch. The other four sites are all within the same outlier branch of relevés that would likely group with the other BaAxS sites if they were quadrats.
BaCdS	Good	Two of the three sites grouped together as one Major Branch. The third site fell as an outlier within the BaAxS grouping due to presence of <i>Acacia</i> aff. <i>xanthocarpa</i> , but can validly be pulled back in with the two BaCdS sites due to a clear dominance of <i>Calytrix desolata</i> . These sites are strongly influenced by the underlying basalt or phyllite shale geology.

 Table 12. Comments on the PATN Classification Dendrogram.



Unit	PATN	Comments
	Grouping	
	10	
BrCP		One releve site an outlier to the Major Group containing BaCdS BaAbs
DICI	-	and Pa AxS Additional sites would likely form a separate dendrogram
		hrench Howaver DATN based this assessment on the dominance of
		branch. However, PATN based this assessment on the dominance of
		two annual species, Aristida contoria and Pittotas neupleroides, neutre
		of which are nabilal specific and boin of which are generalists. The
		grouping is considered an artefact of the sampling density and the
		statistical analysis and does not represent a true pattern in the
		environment.
Qtz	Poor	Two sites that did not pair in analysis, due to low number of Qtz (quartz
		outcrop) sites and small being small polygons showing a relation to
		neighbouring polygons. Could be incorporated into vegetation
		associations surrounding each site.
HPMS	Average	HPMS split to two distant locations on the dendrogram. The primary
		group consists of six HPMS sites forming a majority of a Major Branch
		along with four disparate sites (two of which are drainage that have
		characters of HPMS). The secondary group consists of four HPMS sites
		allied with GRMU sites due to the presence/dominance of Acacia
		ramulosa subsp. ramulosa.
	<u> </u>	
HPMS Thoma	Good	The two HPMS-Thoma sites paired within the secondary grouping of
		HPMS sites, related to GRMU due to dominance of Acacia ramulosa
		subsp. ramulosa. The presence of Acacia thoma may not warrant
	~ 1	separation of this as a community.
HMCS	Good	Two of three sites paired as a relative of the primary HPMS branch. The
		third site occurred within the primary HPMS branch but is retained as
		HMCS due to dominance of <i>Maireana pyramidata</i> in the understorey.
GRMU	Average	Two of three GRMU sites grouped with the secondary grouping of
		HPMS sites. The third GRMU site grouped strongly within a branch of
		seven GRMS sites, and may best be labelled as GRMS.
GRMS	Average	GRMS split into two distant locations on the dendrogram. The primary
		group consists entirely of seven GRMS (one labelled GRMU), all lying
		within its own Major Group. The secondary group consists of five
		GRMS sites mixed with four disparate SIMS sites, all lying within its
		own Major Group. Though separate, both branches share primary
		dominant species (further exploration would likely bring these two
		branches together).
BrGP	Poor	Two sites separate but both within the primary grouping of HPMS
		branch. This unit may be a part of HPMS, but may also pull together
		with additional BrGP added to the analysis. HPMS and BRGP are
		similar in structure but differ markedly in soil, landscape position and
		underlying geology. HPMS may have a range of annual grasses present
		while BrGP has a marked dominance of Aristida contorta in the
		understorey with few other annual grass species.
BrCP - TectS	Perfect	Four sites (two labelled as TECT) all containing <i>Tecticornia</i>
		<i>disarticulata</i> grouped perfectly as one Minor Branch, related to both
		BrCP-FRAN and the secondary grouping USBS branch. The BrCP –
		TectS and BrCP-FRAN communities co-occur as a complex.
BrCP-FRAN	Perfect	All three sites grouped perfectly within one Minor Branch by presence
		of two <i>Frankenia</i> species. This group is closely related to the secondary
		grouping of the USBS sites which is separate due to minor presence of
		<i>Cratystylis subspinescens</i> in discrete natches <b>BrCP-FRAN</b> and <b>BrCP</b> .
		Tect often co-occur as a complex



Unit	PATN Grouping	Comments
USBS	Average	USBS split to two separate locations on the dendrogram. The primary grouping is of five USBS sites together with four non-USBS sites within the Chenopod Major Group. Three USBS Releve sites grouped within a related outlier releve branch and would likely join the primary grouping if they were quadrats. The secondary USBS group consisting of three sites fell together due to presence of small discrete patches of <i>Cratystylis subspinescens</i> . This secondary USBS group forms half of the <i>Maireana</i> Major Group and is related to the BCP-Fran branch. All are saline sites.
EGPW	Perfect	All three sites grouped together well (with one within one unlabelled site) by the presence of <i>Eucalyptus gypsophila</i> . Related to the GHPS branch with understorey species in common.
GHPS	Average	GHPS sites split to two separate locations on the dendrogram. Both separate groupings are dominated by <i>Eremophila pantonii</i> . Four sites grouped due to <i>Hakea leucoptera</i> subsp. <i>sericipes</i> which is always present within the GHPS but may have lain outside quadrats established. Three other sites grouped with GRMU sites due to <i>Acacia ramulosa</i> subsp. <i>ramulosa</i> , likely edge effect. GHPS and SSS almost always co-occur and are adjacent to each other with much in common.
SSS	Poor	Four SSS sites grouped within a Minor Sub Branch (along with WBR00) and are related to the secondary GHPS grouping. Two more SSS sites appear within an outlier releve branch and would likely join the other SSS sites if they were quadrats. Two SSS sites joined into the primary USBS grouping and may belong there. GHPS and SSS almost always co-occur and are adjacent to each other with much in common.
SILS	Perfect	All four sites grouped perfectly within one Minor Branch due to <i>Thryptomene</i> sp. Leinster P3 and <i>Acacia quadrimarginea</i> . Part of the greater WABS/SMS Major Branch.
WABS	Good	All five sites grouped within a single Major Group, but split into two separate branches, separated by the closely related primary grouping of SMS sites.
SMS	Poor	SMS split into four locations on the dendrogram. The primary group consists of a branch of four SMS sites separating the two WABS branches. The remaining five sites are within three different Major Branches.
BrX-FOL	Poor	One site was an outlier to the BrX-P Major Branch, one site an outlier to the secondary GRMS grouping branch, a third site forms part of the BrCP-TectS branch. These communities co-occur and edge effects may have influenced the analysis.
BrX-P	Good	All 3 BrX-P sites grouped into a single Major Branch with a small number of disparate sites by the presence of <i>Thryptomene</i> sp. Leinster P3 and <i>Calytrix uncinata</i> .



## 4. Assessment against the Ten Clearing Principles

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

The MKS Proposal Study Area, inclusive of the proposed haul road to Mt Keith and the MKS Development Footprint on Yakabindie Station, is known to support 393 endemic flora species within 38 Vegetation Associations and two Vegetation Complexes. This is comparable to the species count known at Leinster where 402 endemic species were recorded in studies for WMC Resources. The range of species known within each of the Vegetation Associations at MKS ranges from between 6 and 36 species with a mean of 17 species per Vegetation Association and a standard deviation of 6. This is not considered to be either particularly diverse nor to represent a high degree of endemism for the region, and rather is representative of what may be commonly encountered in the eastern Murchison biogeographic region.

The MKS project is not at variance with this principle.

# Principle (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.

While the vegetation of the MKS Proposal Study Area plays a role in providing fauna habitat, none of the Vegetation Associations that are significantly impacted in development of the MKS Project are known to provide habitat critical to the maintenance of fauna species.

The proposed development has been designed to minimize impacts to the eucalypt dominated ephemeral drainage line of Jones Creek which is considered to be the most significant of habitats from a short-range endemic fauna utilization and refuge perspective, in the Proposal Study Area.

Due to the minor impact on the Jones Creek vegetation Associations, the MKS project is not considered at variance with this principle.

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

No Threatened (Declared Rare) flora is known within the MKS Proposal Study Area. Thirteen Priority flora are known within the MKS Proposal Study Area (two P1, eight P3 and three P4 species). The MKS project is therefore not at variance with this principle.

The majority of species known from the overall MKS Proposal Study Area are both common and widespread in the eastern Murchison, western Great Victoria Desert biogeographic regions. The MKS Proposal Study Area supports 13 Priority Flora species (two P1, eight P3 and three P4 species). The project has been designed to minimize impacts on Priority Flora and development



of the MKS project will not result in an upgrading of the Conservation Statius of any of these Priority Flora species.

A further eight species which represent undescribed flora that do not as yet appear on the Census of Vascular Flora for Western Australia are known from within the MKS Proposal Study Area. These are species that are widely distributed in the eastern Murchison Biogeographic Region and are known cases of inadequate taxonomy. These species neither have, nor require, conservation focus.

One species, *Eremophila* sp. long pedicels (G. Cockerton 1975), represents an undescribed taxon with relatively limited range in the at Mt Keith nickel mine and within the Lake Way and Lake Maitland catchments south-east of Wiluna. It also is regarded as being relatively common within its known range (>50,000 individuals estimated in 4 sub-populations) but may require conservation review. The MKS development impacts on a negligible proportion (~20 plants) of the overall known population this species.

A further group of six undescribed species require taxonomic clarification by expert taxonomists. The MKS Project does not impact on the majority of these undescribed taxa. However, *Acacia* sp. East Murchison Basalt (G. Cockerton & J Warden WB39701) and *Acacia xanthocarpa* flat phyllode form (G Cockerton & J Warden WB39702) occurs within the MKS Disturbance Footprint. These taxa are known within the MKS Proposal Study Area and within the proposed MKS Disturbance Envelope as well as from near Leinster and eastwards to Laverton and westwards to the Booylgoo Range. The taxonomy of these species requires revision by Mr. Bruce Maslin, consequently the conservation status of these species has not been assessed.

The project is not at variance with this principle.

## Principle (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.

No Threatened Ecological Community (TEC) is known within the MKS Proposal Study Area. The MKS Proposal Study Area does lies approximately centrally within the *Violet Ranges* (*Perseverance Greenstone Belt*) vegetation complexes (banded ironstone formation) Priority 1 Priority Ecological Community. The impact to the mapped extent of this PEC by the MKS proposal is 3.76%. However, a review of the description and extent of this PEC is recommended to incorporate adjacent areas of similar geology, landform and vegetation. If so incorporated, the proportional impact to the expanded PEC would be approximately halved.

The project is not at variance with this principle.

Principle (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.



The region inclusive of the MKS Proposal Study Area has been subject to extensive pastoralism, some road infrastructure development and the development of numerous mining operations. Overall, on a regional scale within the eastern Murchison biogeographic region, clearing of land by these activities is small and the land has not been extensively cleared.

The project is not at variance with this principle.

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

While the MKS project is situated adjacent to the Jones Creek, an ephemeral eucalypt lined drainage channel, the development has been designed to minimize impacts on the Jones Creek and its down-stream playa lake systems. Minimal direct impacts are unavoidable in the formation of two crossings across the creek bed.

The project is at variance with this principle, though to a minor extent.

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

Clearing of land for the development of the MKS project will directly result in the clearing of 875.71 ha of land. The boundaries of the MKS project will be managed to prevent disturbance outside the approved development envelope. Through careful design and management, there should be no appreciable land degradation outside the areas of direct clearing for development.

The project is not at variance with this principle.

# Principle (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.

The MKS development area lies adjacent to the western boundary of Wanjarri Nature Reserve. No direct impacts to Wanjarri Nature Reserve will occur. However, it is possible indirect impacts such as dust or aerosol saline water drift may not be fully contained within the development envelope.

The development of the MKS project may impact indirectly on the fauna utilization of the western margin of Wanjarri Nature Reserve.

Principle (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.

Not addressed here.



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

Not addressed here.



#### 5. Limitations

### Scope and Time Available for Field Survey

During the 2016 and 2017 Surveys, and it previous survey events undertaken by Western Botanical (and previously Landcare Services), there was adequate time available for field survey allowing a thorough traversing of the majority of the MKS Proposal Study Area. Conditions during the field surveys were favourable, though warm to hot, meaning the majority of fruits were ripening and plants were dehiscing seeds at the time of survey. The current surveys, combined with the numerous previous assessments of the MKS Proposal Study Area have provided multiple opportunities to encounter flora at different growth stages. We are satisfied that the assessments conducted represent a thorough review of both the vegetation and flora of the MKS Proposal Study Area.

## Timing of Surveys and implications for plant identifications and distributions of cryptic species.

The late 2016 survey conducted in late spring 2016 meaning most annuals were either seeding or senescent. Few species that, based on previous records, specifically required collection of flowering and/or fruiting material to address taxonomic issues were neither in flower or fruit. However, many perennial tree species were holding mature fruit, which enabled detailed taxonomic investigation and resolution of the Acacia aneura sens. lat. group into their species complexes as well as the collection of fruits of other Acacia species enabling a more detailed review of their taxonomic status.

Combined with the May 2016 site visit when many Acacia species were in flower and were specifically collected, the late Spring 2016 assessment allowed for the corresponding collection of fruiting material of these species. Further studies in 2017 added flowering and fruiting material as needed. This will enable the taxonomic status of the Acacia xanthocarpa complex, Acacia sp. East Murchison Basalt, Acacia subtessarogona flat pod form and Acacia doreta long phyllode form to be thoroughly assessed when the relevant specialist taxonomists are available.

Populations of the Priority 1 Anacampseros sp. Eremaean (F. Hort, J. Hort & J. Shanks 3248) are very difficult to assess as the plants are geophytic ephemerals. Timing is the key to effective survey and a very narrow window of opportunity exists following substantial rainfall events to assess this species. The records of Anacampseros sp. Eremaean are therefore considered indicative and it is highly likely more exist in both the local area and the broader region.

### **Cumulative Species Lists**

Overall, the cumulative species list for the MKS Proposal Study Area is considered very extensive and well representative with a total of 393 species, varieties and 18 putative hybrids between varieties of Mulga. It compares with 102 species (excluding species level Mulga



varieties) known from a limited area at Mt Keith (Landcare Services, 1997a) and 402 species (excluding species level Mulga varieties) known over an extensive area at Leinster (Landcare Services, 1997b). The extensive MKS species list, generated over many on-ground assessments over numerous years of field survey, is considered highly representative and is therefore not considered a limitation.

### Violet Range Priority Ecological Community

The scope allowed for a cursory review of some of the landforms, and vegetation south of the MKS Proposal Study Area within the southern extents of the currently mapped Violet Range PEC. The limited availability of well formed tracks and rough terrain meant that only a few tracks could be traversed safely in the time available. The discussion of the Violet Range PEC outside the MKS Proposal Study Area presented within this document is therefore considered only a reconnaissance level assessment at this stage.

The definition and extents of the Violet Range PEC warrant revision to reflect on-ground observations, however, this lies outside the scope of this assessment.

## Taxonomy

The tenuous state of the taxonomy of many flora groups raises numerous queries as to the actual taxonomic status of some species. For example, *Olearia* sp. Sherwood Breakaways (currently included within *Olearia stuartii*) and *Olearia xerophila sens. lat.* are two good examples of where species have highly disjunct distributions across the Australian continental land mass. Further, 'Type' specimens of these have been collected in either Queensland or New South Wales and yet the species in Western Australia are currently considered the same as those in the eastern states. In reality, this is highly improbable and preliminary evidence suggests that the Western Australian taxa are new species. However, until the taxonomy of these groups is definitively reviewed, there will remain doubt over species relationships and therefore inaccurate conservation assessment of the species in question.

The taxonomy of a range of new species of *Acacia* associated with the greenstone geology of the MKS Proposal Study Area requires revision by Mr. Brice Maslin. Following this, an assessment of their conservation status can be undertaken. Adequate fruiting material of these species has been collected in targeted surveys implemented by Nickel West in August – October 2017 and finalisation of this process is awaiting Mr. Maslin's availability in late 2017.

### **Regional Context for Priority Flora Species**

No opportunity existed to gather regional context for the majority of Priority Flora or Species of Interest in this assessment other than through desktop reviews and reconnaissance surveys. Exceptions to this were:



(i) targeted surveys undertaken for *Hibbertia* sp. Sherwood Breakaways (R.J. Cranfield 6771) P1 where regional assessments between Wanjarri Nature Reserve and Yeelirrie were conducted on suitable breakaway habitats. Findings of this survey discovered a second species, *Hibbertia arcuata* eastern phenotype (G. Cockerton & J. Warden 39704), (an informal name, not on Florabase) occurring on similar habitat south of Wanjarri Nature Reserve, north of the Mt Keith nickel mine and on breakaways on Yeelirrie Station. This latter species does not occur within the MKS Proposal Study Area and is not discussed in this document.



## 6. Acknowledgements

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- Mr. Bruce Maslin, (2010, 2016, 2017), Western Australian Herbarium, for review of *Acacia* specimens.
- Dr. Kelly Shepherd, (2010, 2016, 2017), Western Australian Herbarium, for review of *Tecticornia*.
- Mr. Malcolm Trudgen, (2010, 2016, 2017), Western Australian Herbarium, for review of small flowered Myrtaceae.
- Dr. Kevin Thiele (Feb 2012) for review of *Hibbertia* sp. aff. *H. exasperata* and *Hibbertia* sp. aff. *H. arcuata* collected in the region.
- Dr. Kevin Thiele, Mr. Nick Lander (2011, 2016), Western Australian Herbarium, for review of *Olearia* specimens.
- Dr. Steven Dillon (2016, 2017), Western Australian Herbarium, for review of *Olearia* specimens and for comments on *Acacia xanthocarpa* flat phyllode form.
- Dr. Adrienne Markey (2017), for comments on Acacia xanthocarpa flat phyllode form.
- Dr. Neil Gibson (2016), Department of Biodiversity, Conservation and Attractions, for comments on the DEC Survey of the Violet Range, Meissner & Wright (2010).



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## 8. List of Participants

Title	Personnel & Role				
Project Manager and Senior Botanist	Geoff Cockerton, field survey, reporting.				
Senior Botanists	Jono Warden, field survey, reporting.				
	Daniel Brassington, field survey, reporting.				
	Dr. David Leach, statistical analyses, reporting.				
	Ben Eckermann, field survey.				
Field Assistants	Sarah Smith, field survey.				
	Steven Cockerton, field survey.				



Appendix 1. Systematic Species List



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Acanthaceae	Harnieria kempeana subsp. muelleri			1	1
Aizoaceae	Gunniopsis propinqua	PRIORITY 3			1
Aizoaceae	Gunniopsis septifraga				1
Aizoaceae	Mesembryanthemum nodiflorum *		Weed		1
Amaranthaceae	Alternanthera nodiflora			1	
Amaranthaceae	Ptilotus aervoides			1	
Amaranthaceae	Ptilotus astrolasius				1
Amaranthaceae	Ptilotus gaudichaudii subsp. gaudichaudii			1	
Amaranthaceae	Ptilotus helipteroides			1	1
Amaranthaceae	Ptilotus nobilis		Inclusive of <i>P. exaltatus</i>	1	1
Amaranthaceae	Ptilotus obovatus (typical Goldfields form) (G. Cockerton, J. Grehan, L. Trotter, J. Symington 15213)		Undescribed, Common and Widespread	1	1
Amaranthaceae	Ptilotus obovatus (upright form) (G. Cockerton, J. Grehan, L. Trotter, J. Symington LCH 15209)		Undescribed, Common and Widespread		1
Amaranthaceae	Ptilotus polystachyus			1	1
Amaranthaceae	Ptilotus roei			1	1
Amaranthaceae	Ptilotus schwartzii			1	1
Apocynaceae	Marsdenia australis			1	1
Apocynaceae	Rhyncharrhena linearis			1	1
Asparagaceae	Thysanotus manglesianus				1
Asteraceae	Actinobole uliginosum			1	
Asteraceae	Angianthus sp. Indeterminate				1
Asteraceae	Angianthus tomentosus			1	
Asteraceae	Bidens bipinnata *		Weed		1
Asteraceae	Brachyscome ciliaris			1	
Asteraceae	Brachyscome ciliocarpa			1	
Asteraceae	Brachyscome iberidifolia			1	
Asteraceae	Brachyscome sp. (indeterminate)				1
Asteraceae	Calocephalus multiflorus				1
Asteraceae	Calotis hispidula				1
Asteraceae	Calotis multicaulis				1
Asteraceae	Cephalipterum drummondii			1	1
Asteraceae	Chrysocephalum puteale				1
Asteraceae	Cratystylis subspinescens			1	1
Asteraceae	Erymophyllum ramosum			1	1
Asteraceae	Gnephosis arachnoidea			1	1
Asteraceae	Gnephosis tenuissima				1
Asteraceae	Helipterum craspedioides			1	1
Asteraceae	Myriocephalus rudallii			1	



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Asteraceae	<i>Olearia xerophila sens. lat.</i> (G. Cockerton & P. Goodman WB38116)		Undescribed, new species, Range Extension, Widespread in Pilbara WA	1	1
Asteraceae	<i>Olearia</i> sp. Sherwood Breakaways (A. Taylor 25552)		Undescribed, Widespread	1	1
Asteraceae	Pluchea dentex			1	1
Asteraceae	Podolepis capillaris			1	1
Asteraceae	Podolepis eremaea		Some records previously reported as <i>P.</i> <i>canescens</i>	1	
Asteraceae	Rhodanthe charsleyae			1	1
Asteraceae	Rhodanthe chlorocephala subsp. splendida				1
Asteraceae	Rhodanthe maryonii			1	
Asteraceae	Roebuckiella ciliocarpa		Previously reported as Brachyscome ciliocarpa	1	
Asteraceae	Senecio magnificus			1	
Asteraceae	Streptoglossa liatroides			1	1
Asteraceae	Vittadinia sulcata				1
Boraginaceae	Trichodesma zeylanicum			1	1
Brassicaceae	Lepidium phlebopetalum				1
Brassicaceae	Lepidium platypetalum			1	1
Brassicaceae	Menkea sphaerocarpa			1	
Campanulaceae	Isotoma petraea			1	
Campanulaceae	Lobelia heterophylla				1
Campanulaceae	Wahlenbergia tumidifructa				1
Casuarinaceae	Casuarina pauper			1	1
Celastraceae	Stackhousia muricata subsp. Annual (W.R. Barker 2172)		Undescribed, Common and Widespread	1	1
Celastraceae	<i>Stackhousia</i> sp. Mt Keith (G. Cockerton & G. O'Keefe 11017)		Undescribed, Common and Widespread	1	1
Chenopodiaceae	Atriplex codonocarpa			1	1
Chenopodiaceae	Atriplex quinii			1	1
Chenopodiaceae	Atriplex semilunaris				1
Chenopodiaceae	Dysphania glomulifera		Likely subsp. eremaea	1	
Chenopodiaceae	Dysphania kalpari			1	
Chenopodiaceae	Dysphania melanocarpa			1	
Chenopodiaceae	Dysphania rhadinostachya		Likely subsp. rhadinostachya	1	1
Chenopodiaceae	Dysphania rhadinostachya subsp. rhadinostachya				1
Chenopodiaceae	Enchylaena lanata				1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Chenopodiaceae	Enchylaena tomentosa			1	
Chenopodiaceae	Eriochiton sclerolaenoides				1
Chenopodiaceae	Maireana carnosa			1	1
Chenopodiaceae	Maireana convexa				1
Chenopodiaceae	Maireana gardneri				1
Chenopodiaceae	Maireana georgei			1	1
Chenopodiaceae	Maireana georgei x Enchylaena tomentosa (hybrid)				1
Chenopodiaceae	Maireana glomerifolia			1	1
Chenopodiaceae	Maireana melanocoma		Range Extension		1
Chenopodiaceae	Maireana planifolia		Some records previously reported as <i>M.</i> <i>radiata</i>	1	1
Chenopodiaceae	<i>Maireana planifolia</i> (long leaf form)				1
Chenopodiaceae	Maireana pyramidata			1	1
Chenopodiaceae	Maireana radiata				1
Chenopodiaceae	Maireana thesioides			1	1
Chenopodiaceae	Maireanatomentosa(indeterminate subspecies)			1	1
Chenopodiaceae	Maireana tomentosa subsp. tomentosa				1
Chenopodiaceae	Maireana tomentosa Type l Breakaway footslopes (G. Cockerton & D. Brassington WB38650)		Undescribed		1
Chenopodiaceae	Maireana trichoptera				1
Chenopodiaceae	Maireana triptera			1	1
Chenopodiaceae	Maireana villosa		Some records previously reported as <i>M.</i> <i>radiata</i>	1	
Chenopodiaceae	Rhagodia drummondii			1	1
Chenopodiaceae	Salsola australis		Some previous records as S. tragus	1	1
Chenopodiaceae	Sclerolaena convexula				1
Chenopodiaceae	Sclerolaena cornishiana			1	
Chenopodiaceae	Sclerolaena cuneata			1	1
Chenopodiaceae	Sclerolaena densiflora				1
Chenopodiaceae	Sclerolaena deserticola			1	
Chenopodiaceae	Sclerolaena diacantha			1	1
Chenopodiaceae	Sclerolaena eriacantha			1	1
Chenopodiaceae	Sclerolaena fusiformis				1
Chenopodiaceae	Sclerolaena gardneri		Some previous records as <i>S. aff.</i> <i>eriacantha</i>	1	1
Chenopodiaceae	Sclerolaena lanicuspis			1	1
Chenopodiaceae	Sclerolaena lanicuspis (5 spine				1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
	variant)				
Chenopodiaceae	Sclerolaena obliquicuspis				1
Chenopodiaceae	Sclerolaena patenticuspis				1
Chenopodiaceae	Tecticornia disarticulata			1	1
Colchicaceae	Wurmbea deserticola			1	
Colchicaceae	Wurmbea tenella				1
Convolvulaceae	Bonamia erecta		Previous records as <i>B. rosea</i>	1	
Convolvulaceae	Cuscuta planiflora				1
Convolvulaceae	Duperreya commixta				1
Convolvulaceae	Duperreya sericea			1	1
Crassulaceae	Crassula colorata var. acuminata				1
Cupressaceae	Callitris columellaris			1	1
Cyperaceae	Bulbostylis barbata			1	
Cyperaceae	Cyperus centralis			1	1
Cyperaceae	Cyperus iria			1	
Dilleniaceae	Hibbertia sp. Sherwood Breakaways (R.J. Cranfield 6771)	PRIORITY 1	Previously reported as H. sp. aff. <i>exasperata</i> (G. Cockerton & G. O'Keefe 11911)	1	1
Euphorbiaceae	Euphorbia boophthona			1	
Euphorbiaceae	Euphorbia drummondii			1	1
Fabaceae	Acacia aneura			1	1
Fabaceae	Acacia aneura (hybrid)				1
Fabaceae	Acacia aneura sens. lat.		Mulga complex		1
Fabaceae	Acacia aptaneura				1
Fabaceae	Acacia aptaneura x (hybrid)				1
Fabaceae	<i>Acacia aptaneura</i> x <i>mulganeura</i> (hybrid)				1
Fabaceae	Acacia ayersiana			1	
Fabaceae	<i>Acacia ayersiana</i> (narrow phyllode variant)				1
Fabaceae	Acacia brachystachya		Range Extension		1
Fabaceae	Acacia burkittii			1	1
Fabaceae	Acacia caesaneura				1
Fabaceae	Acacia caesaneura (hybrid)				1
Fabaceae	<i>Acacia caesaneura</i> (narrow phyllode variant)				1
Fabaceae	Acacia colletioides			1	
Fabaceae	Acacia craspedocarpa			1	1
Fabaceae	<i>Acacia craspedocarpa</i> (ovate phyllode variant, hybrid)				1
Fabaceae	<i>Acacia doreta</i> long phyllode form (G. Cockerton & S. Cockerton WB38633)		Undescribed, Previously reported as A. grasbyi	1	1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Fabaceae	Acacia effusifolia		Previously A. coolgardiensis subsp. effusa	1	1
Fabaceae	Acacia fuscaneura		1 00		1
Fabaceae	Acacia fuscaneura x				1
Fabaceae	Acacia fuscaneura x pteraneura				1
Fabaceae	Acacia incurvaneura				1
Fabaceae	Acacia incurvaneura (hybrid)				1
Fabaceae	Acacia incurvaneura x mulganeura				1
Fabaceae	Acacia incurvaneura x pteraneura				1
Fabaceae	Acacia jamesiana			1	
Fabaceae	Acacia kempeana			1	1
Fabaceae	Acacia macraneura				1
Fabaceae	Acacia macraneura (hybrid)				1
Fabaceae	Acacia macraneura x aneura				1
Fabaceae	Acacia macraneura x aptaneura				1
Fabaceae	Acacia minyura			1	1
Fabaceae	Acacia mulganeura				1
Fabaceae	Acacia mulganeura (hybrid)				1
Fabaceae	Acacia mulganeura x caesaneura				1
Fabaceae	<i>Acacia oswaldii</i> long phyllode form (G. Cockerton & S. Cockerton WB38622)		Undescribed, Common and Widespread. Previously reported as A. oswaldii		1
Fabaceae	Acacia pachyacra			1	
Fabaceae	Acacia paraneura				1
Fabaceae	Acacia pruinocarpa			1	1
Fabaceae	Acacia pteraneura				1
Fabaceae	<i>Acacia pteraneura</i> (narrow pod variant)				1
Fabaceae	Acacia quadrimarginea sensu stricto			1	1
Fabaceae	Acacia ramulosa var. linophylla			1	1
Fabaceae	Acacia ramulosa var. ramulosa			1	
Fabaceae	Acacia rhodophloia			1	1
Fabaceae	Acacia subtessarogona flat pod form (G. Cockerton WB38658)		Undescribed. Previously reported as A. cuthbertsonii	1	1
Fabaceae	Acacia sp. East Murchison Basalt (G. Cockerton & J Warden WB39701)		Undescribed	1	1
Fabaceae	Acacia xanthocarpa typical form (G. Cockerton & S. Cockerton WB38615)		Undescribed, some previous records as <i>A. xanthocarpa</i>	1	1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Fabaceae	<i>Acacia xanthocarpa</i> flat phyllode form (G Cockerton & J Warden WB39702)		Undescribed		1
Fabaceae	Acacia tetragonophylla			1	1
Fabaceae	Acacia thoma			1	1
Fabaceae	Gastrolobium laytonii			1	1
Fabaceae	Leptosema chambersii			1	
Fabaceae	Mirbelia rhagodioides			1	1
Fabaceae	Muelleranthus trifoliolatus			1	
Fabaceae	Senna artemisioides		No subspecies specified	1	
Fabaceae	Senna artemisioides subsp. filifolia			1	1
Fabaceae	Senna artemisioides subsp. helmsii			1	1
Fabaceae	Senna artemisioides subsp. helmsii			1	1
Fabaceae	Senna artemisioides subsp. petiolaris				1
Fabaceae	Senna artemisioides subsp. x artemisioides		Previously reported as S. <i>artemisioides</i> subsp. <i>sturtii</i>	1	1
Fabaceae	Senna charlesiana			1	1
Fabaceae	Senna glaucifolia				1
Fabaceae	Senna glutinosa		No subspecies specified	1	
Fabaceae	Senna glutinosa subsp. chatelainiana				1
Fabaceae	Senna manicula			1	1
Fabaceae	Senna sp. Austin (A. Strid 20210)		Undescribed, Common and Widespread		1
Fabaceae	Senna sp. Meekatharra (E. Bailey 1-26)		Undescribed, Common and Widespread. Previously reported as S. artemisioides subsp. sturtii		1
Fabaceae	Swainsona formosa			1	
Frankeniaceae	Frankenia laxiflora		Some records previously reported as <i>F. georgei</i>	1	1
Frankeniaceae	Frankenia pauciflora			1	
Frankeniaceae	Frankenia setosa			1	1
Geraniaceae	Erodium cygnorum			1	
Goodeniaceae	Brunonia australis			1	
Goodeniaceae	Goodenia havilandii			1	
Goodeniaceae	Goodenia macroplectra			1	
Goodeniaceae	Goodenia occidentalis			1	1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Goodeniaceae	<i>Scaevola spinescens</i> (broad leaf non-spiny form)		Undescribed, Common and Widespread	1	1
Goodeniaceae	<i>Scaevola spinescens</i> (narrow leaf spiny form)		Undescribed, Common and Widespread	1	1
Goodeniaceae	<i>Scaevola spinescens</i> terete leaf spiny form)		Undescribed, Common and Widespread	1	
Goodeniaceae	<i>Scaevola spinescens</i> (undefined form)			1	1
Goodeniaceae	Velleia rosea			1	1
Haloragaceae	Haloragis odontocarpa		Three possible forms	1	
Haloragaceae	Haloragis trigonocarpa			1	
Hemerocallidaceae	Dianella revoluta var. divaricata		Previously reported as Dianella revoluta	1	1
Juncaceae	Juncus aridicola		Some previously reports as J. subsecundus	1	1
Lamiaceae	Hemigenia exilis	PRIORITY 4		1	1
Lamiaceae	Lachnostachys verbascifolia			1	
Lamiaceae	Prostanthera althoferi subsp. althoferi				1
Lamiaceae	Prostanthera campbellii		Part of a complex requiring taxonomic revision	1	
Lamiaceae	Prostanthera wilkieana			1	
Lamiaceae	Spartothamnella teucriiflora			1	1
Loranthaceae	Amyema fitzgeraldii		Parasitic on Acacia		1
Loranthaceae	Amyema gibberula var. gibberula		Parasitic on Grevillea berryana		1
Loranthaceae	Amyema hilliana		Parasitic on Acacia pruinocarpa	1	
Loranthaceae	Amyema miquelii		Parasitic on Eucalyptus	1	
Loranthaceae	Lysiana murrayi		Parasitic on Acacia		1
Malvaceae	Abutilon cryptopetalum			1	1
Malvaceae	Abutilon otocarpum			1	
Malvaceae	Abutilonoxycarpumsubsp.Prostrate(A.A.MitchellPRP1266)		Undescribed, Common and Widespread	1	1
Malvaceae	Androcalva luteiflora		Previously reported as <i>Rulingia</i> <i>luteiflora</i>	1	
Malvaceae	Brachychiton gregorii			1	



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Malvaceae	Hibiscus burtonii			1	1
Malvaceae	Hibiscus krichauffianus	PRIORITY 3			1
Malvaceae	Hibiscus solanifolius			1	1
Malvaceae	Hibiscus sp. Indeterminate				1
Malvaceae	Hibiscus sturtii var. grandiflorus			1	1
Malvaceae	Seringia velutina		Formerly reported as <i>Keraudrenia</i> <i>elliptica</i> subsp. <i>elliptica</i> or subsp. <i>velutina</i>	1	
Malvaceae	Sida calyxhymenia				1
Malvaceae	Sida cardiophylla			1	
Malvaceae	Sida ectogama		Some previous records as S. calyxhymenia	1	1
Malvaceae	Sida fibulifera				1
Malvaceae	Sida picklesiana	PRIORITY 3		1	1
Malvaceae	Sida sp. dark green fruits (S. van Leeuwen 2260)		Undescribed, Common and Widespread	1	1
Malvaceae	<i>Sida</i> sp. Excedentifolia (J.L. Egan 1925)		Undescribed, Common and Widespread	1	
Malvaceae	<i>Sida</i> sp. Golden calyces glabrous (H.N. Foote 32)		Undescribed, Common and Widespread		1
Malvaceae	<i>Sida</i> sp. spiciform panicles (E. Leyland s.n. 14/8/90)		Undescribed, Common and Widespread		1
Malvaceae	<i>Sida</i> sp. tiny glabrous fruit (A.A. Mitchell PRP1152)		Undescribed, Common and Widespread	1	
Malvaceae	<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)		Undescribed, Common and Widespread	1	1
Marsileaceae	Marsilea drummondii			1	
Myrtaceae	Calytrix desolata			1	1
Myrtaceae	Calytrix erosipetala				1
Myrtaceae	Calytrix uncinata			1	1
Myrtaceae	<i>Eucalyptus camaldulensis</i> subsp. <i>obtusa</i>			1	1
Myrtaceae	Eucalyptus carnei			1	1
Myrtaceae	Eucalyptus gypsophila			1	1
Myrtaceae	Eucalyptus kingsmillii		Likely subsp. kingsmillii	1	1
Myrtaceae	Eucalyptus kochii		Either subsp. amaryssia or subsp. plenissima	1	
Myrtaceae	<i>Eucalyptus leptopoda</i> subsp. <i>elevata</i>				1



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Myrtaceae	Eucalyptus lucasii			1	
Myrtaceae	Eucalyptus oldfieldii			1	
Myrtaceae	Eucalyptus trivalva			1	
Myrtaceae	Melaleuca leiocarpa		Sandplain form	1	1
Myrtaceae	Micromyrtus flaviflora		On sandplains	1	
Myrtaceae	Micromyrtus sulphurea		On breakaways	1	1
Myrtaceae	<i>Thryptomene</i> sp. Leinster (B.J. Lepschi & L.A. Craven 4362)	PRIORITY 3		1	1
Myrtaceae	Verticordia jamiesonii	PRIORITY 3		1	1
Oleaceae	Jasminum calcareum			1	1
Ophioglossaceae	Ophioglossum lusitanicum			1	
Pittosporaceae	Pittosporum angustifolium			1	1
Plantaginaceae	Plantago drummondii				1
Plantaginaceae	Stemodia florulenta				1
Poaceae	Aristida contorta			1	1
Poaceae	Aristida ?jerichoensis var. subspinulifera	PRIORITY 3	Range Extension		1
Poaceae	Austrostipa elegantissima				1
Poaceae	Austrostipa nitida				1
Poaceae	Cenchrus ciliaris *		Weed		1
Poaceae	Cenchrus setiger *		Weed		1
Poaceae	Chloris truncata			1	
Poaceae	Cymbopogon ambiguus			1	1
Poaceae	Dactyloctenium radulans			1	
Poaceae	Digitaria brownii			1	1
Poaceae	Enneapogon caerulescens			1	1
Poaceae	Enneapogon cylindricus			1	1
Poaceae	Enneapogon polyphyllus			1	
Poaceae	<i>Enneapogon</i> sp. (Indeterminate)				1
Poaceae	Enteropogon ?ramosus				1
Poaceae	Enteropogon ramosus				1
Poaceae	Eragrostis dielsii			1	1
Poaceae	Eragrostis eriopoda			1	1
Poaceae	Eragrostis falcata				1
Poaceae	Eragrostis kennedyae			1	1
Poaceae	Eragrostis leptocarpa			1	
Poaceae	Eragrostis pergracilis			1	
Poaceae	Eragrostis setifolia			1	1
Poaceae	<i>Eragrostis</i> sp. (Indeterminate)				1
Poaceae	Eriachne flaccida			1	
Poaceae	Eriachne helmsii				1
Poaceae	<i>Eriachne mucronata</i> (typical form)			1	1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Poaceae	Eriachne mucronata (Arid Form)		Some records previously reported as <i>Eragrostis</i> <i>desertorum</i>	1	1
Poaceae	Eriachne pulchella subsp. dominii			1	1
Poaceae	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>			1	1
Poaceae	Eulalia aurea			1	
Poaceae	Iseilema ?eremaeum			1	1
Poaceae	Monachather paradoxus			1	1
Poaceae	Neurachne minor			1	1
Poaceae	Neurachne munroi			1	1
Poaceae	Panicum decompositum			1	1
Poaceae	Paspalidium constrictum				1
Poaceae	Paspalidium gracile				1
Poaceae	Perotis rara			1	
Poaceae	Poaceae sp. (Indeterminate)				1
Poaceae	Setaria dielsii				1
Poaceae	Themeda avenacea			1	
Poaceae	Themeda triandra				1
Poaceae	Thyridolepis multiculmis				1
Poaceae	Triodia basedowii			1	1
Poaceae	Tripogon loliiformis				1
Polygalaceae	Polygala isingii			1	
Polygoniaceae	Rumex vesicarius *		Weed		1
Portulacaceae	<i>Anacampseros</i> sp. Eremaean (F. Hort, J. Hort & J. Shanks 3248)	PRIORITY 1		1	
Portulacaceae	Calandrinia ptychosperma			1	
Portulacaceae	Calandrinia sp.				1
Portulacaceae	Portulaca oleracea			1	
Primulaceae	Lysimachia arvensis *		Weed		1
Proteaceae	Grevillea berryana		Formerly reported as G. <i>nematophylla</i> at MKS	1	1
Proteaceae	Grevillea deflexa				1
Proteaceae	Grevillea inconspicua	PRIORITY 4			1
Proteaceae	Grevillea juncifolia		Either subsp. <i>juncifolia</i> or subsp. <i>temulenta</i>	1	
Proteaceae	Hakea leucoptera subsp. sericipes			1	1
Proteaceae	Hakea lorea subsp. lorea			1	1
Proteaceae	Hakea minyma			1	1
Proteaceae	Hakea preissii			1	1
Proteaceae	Hakea recurva subsp. arida				1



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Proteaceae	Hakea recurva subsp. recurva		Some previous records as <i>Hakea arida</i> subsp. <i>arida</i>	1	1
Pteridaceae	Cheilanthes brownii				1
Pteridaceae	Cheilanthes sieberi subsp. sieberi			1	1
Rubiaceae	Psydrax latifolia			1	1
Rubiaceae	Psydrax rigidula		Some previous records as <i>P. attenuata</i>	1	1
Rubiaceae	Psydrax suaveolens			1	1
Rutaceae	Philotheca tomentella			1	
Santalaceae	Exocarpos aphyllus			1	1
Santalaceae	Exocarpos sparteus			1	1
Santalaceae	Santalum lanceolatum			1	1
Santalaceae	Santalum spicatum			1	1
Sapindaceae	Dodonaea petiolaris			1	1
Sapindaceae	Dodonaea rigida			1	1
Sapindaceae	Dodonaea viscosa subsp. angustissima			1	
Sapindaceae	Dodonaea viscosa subsp. spatulata		Formerly reported as D. viscosa	1	1
Scrophulariaceae	Eremophila clarkei			1	
Scrophulariaceae	Eremophila conglomerata				1
Scrophulariaceae	<i>Eremophila decipiens</i> subsp. <i>decipiens</i>			1	1
Scrophulariaceae	Eremophila exilifolia			1	1
Scrophulariaceae	Eremophila flabellata				1
Scrophulariaceae	Eremophila foliosissima				1
Scrophulariaceae	Eremophila forrestii subsp. forrestii		Some previous records as <i>E. forrestii</i>	1	1
Scrophulariaceae	Eremophila galeata			1	1
Scrophulariaceae	<i>Eremophila galeata</i> x <i>platycalyx</i> subsp. Neds Creek		Previously reported as <i>E.</i> <i>galeata</i> x <i>platycalyx</i> subsp. "acuticalyx" Hybrid (G. Cockerton & K. Stratford 32741)	1	
Scrophulariaceae	Eremophila gilesii subsp. variabilis			1	1
Scrophulariaceae	Eremophila glabra		Likely subsp. glabra	1	
Scrophulariaceae	Eremophila glutinosa			1	1
Scrophulariaceae	Eremophila granitica			1	1
Scrophulariaceae	Eremophila homoplastica			1	1
Scrophulariaceae	Eremophila jucunda subsp. jucunda			1	1



Family	Species Name	Cons Status	Notes	Prior Record	2016 Collection
Scrophulariaceae	Eremophila latrobei		Unspecified form	1	1
Scrophulariaceae	Eremophila latrobei subsp. filiformis		Some previous reports as <i>E.</i> <i>latrobei</i> subsp. <i>filifolia</i>	1	1
Scrophulariaceae	Eremophila latrobei subsp. glabra			1	1
Scrophulariaceae	Eremophila latrobei var. tuberculosa				1
Scrophulariaceae	<i>Eremophila longifolia</i> (green foliage form)		Previous records as <i>E longifolia</i>	1	1
Scrophulariaceae	Eremophila mackinlayi		Likely subsp. spathulata	1	
Scrophulariaceae	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>		-	1	1
Scrophulariaceae	Eremophila malacoides			1	1
Scrophulariaceae	Eremophila margarethae			1	1
Scrophulariaceae	Eremophila oldfieldii subsp. angustifolia			1	1
Scrophulariaceae	Eremophila oppositifolia subsp. angustifolia			1	1
Scrophulariaceae	Eremophila pantonii			1	1
Scrophulariaceae	Eremophila platycalyx		Subspecies not defined	1	
Scrophulariaceae	<i>Eremophila platycalyx</i> subsp. Neds Creek (N.H. Speck 1228)		Undescribed	1	1
Scrophulariaceae	Eremophila platythamnos subsp. platythamnos			1	1
Scrophulariaceae	Eremophila ramiflora			1	1
Scrophulariaceae	Eremophila serrulata				1
Scrophulariaceae	Eremophila simulans subsp. lapidensis		Some previous reports as <i>E.</i> <i>simulans</i>	1	
Scrophulariaceae	<i>Eremophila</i> sp. Leinster (R.J. Cranfield 6767)		Currently curated under <i>E.</i> <i>conglomerata</i> , formerly under <i>E. pungens</i> .	1	1
Scrophulariaceae	<i>Eremophila</i> sp. long pedicels (G. Cockerton 1975)		Undescribed, of limited distribution	1	1
Scrophulariaceae	Eremophila spectabilis subsp. brevis		Some previous records as <i>Eremophila</i> spectabilis	1	1
Scrophulariaceae	Eremophila youngii subsp. youngii			1	1
Solanaceae	Nicotiana occidentalis		Either subsp. obliqua or subsp. occidentalis	1	
Solanaceae	Solanum cleistogamum		Some previous reports as <i>S. ellipticum</i>	1	1
Solanaceae	Solanum ferocissimum			1	



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Solanaceae	Solanum lachnophyllum		Unlikely, if present would represent a slight range extension	1	
Solanaceae	Solanum lasiophyllum			1	1
Solanaceae	Solanum nummularium			1	1
Stylidiaceae	Stylidium induratum			1	
Thymelaeaceae	Pimelea microcephala subsp. microcephala		Previously reported as <i>Pimelea</i> microcephala	1	1
Violaceae	Hybanthus floribundus subsp. chloroxanthus	PRIORITY 3	Some previous records as <i>H. floribundus</i>	1	1
Zygophyllaceae	Tribulus adelacanthus	PRIORITY 3	Some previous reports as <i>T. cistoides</i>	1	
Zygophyllaceae	Tribulus astrocarpus			1	
Zygophyllaceae	Zygophyllum aurantiacum		May be subsp. aurantiacum	1	
Zygophyllaceae	Zygophyllum compressum		Previously reported as Z. <i>apiculatum</i>	1	
Zygophyllaceae	Zygophyllum eremaeum			1	
Zygophyllaceae	Zygophyllum iodocarpum			1	1
Totals	389 Taxa			268	292

