VEGETATION CONDITION SURVEY: KELLERBERRIN – YELBENI ROAD, SHIRE OF KELLERBERRIN. SLK 0 - SLK 22

BOTANICAL SURVEY CONDUCTED BY: [redacted]

GIS SURVEY DATA: [redacted]

RECONNAISANCE SURVEY CONDUCTED ON 1.10.2

TARGETED SURVEY CONDUCTED ON 25.11.20

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INTRODUCTION:

The Shire of Kellerberrin has contracted Santaleuca Consulting to conduct a vegetation condition survey of the Kellerberrin – Yelbeni Road, in the Shire of Kellerberrin, from SLK 0 to SLK 22.

The Shire of Kellerberrin intends to apply to the Department of Water and Environmental Regulation (DWER) for a clearing permit for this section of road, to enable road widening activities to occur. This road has been identified as being a strategic grain freight route from the northern boundary of Kellerberrin Shire into the central Grain Receival Depot at Kellerberrin. The first survey was conducted on 1.10.20.

METHODOLOGY:

For the 22 kilometres of road to be assessed, it needed to be driven by car and an SLK meter as an Application on a mobile phone used to plot position. The App is supplied by the road engineering company, Fulton Hogan and clearly positions the vehicle being driven at any time to a GPS co-ordinate. In this way, notes can be taken and a log created as to the condition of the roadside vegetation at any time. Any unusual vegetation types or occurrences can be stopped on and a more in- depth survey conducted at any time.

The most notable vegetation occurrence is at Burges Spring Nature Reserve (R563) which is 93.4 hectares in size, between Yorkrakine Rock Road and Scott Road. Surrounding the Reserve 563 is a larger remnant interspersed with farmland where accessible.

Title Details of Burges Rock Reserve (R563)

As the Reserve and surrounding private property required the most in depth surveying the species survey was broken into smaller segments due to the fact that at least 3 Priority species were identified as occurring in the vicinity of the Reserve and that two distinct vegetation types occur there.

A query was asked of the Naturemap data and 3 species were listed as being found in the vicinity of the Reserve. They were Acacia *merrickiae,* P4, Guichenotia *seorsifolia*, T, Leucopogon *amplectans*, P2. These species were especially targeted in our search of the Reserve. At SLK 12.2 a set of very old "Hockey Sticks" were found which were placed originally to warn of the presence of a Rare or Priority species.

The roadside survey starts at Yorkrakine Rock Rd and works south and west from SLK12.1 to SLK0. To the north of the reserve, the survey started at SLK12.6 and extended to SLK 22, where the Shire of Kellerberrin gives way to the Shire of Trayning.

DISCUSSION – BURGES SPRING RESERVE, (R563)

Burges Spring Reserve is situated between Yorkrakine Rock Rd and Scott Rd in the Shire of Kellerberrin. It is essentially a granite based remnant dominated by Eucalyptus loxophleba ssp loxophleba (York Gum), Acacia acuminata (Jam) and Allocasuarina huegelliana (Rock Sheoak) vegetation types.

When the original Road was constructed granite rock and boulders impeded its' construction on the original road reserve and it was subsequently constructed on a curving arc through the reserve along a route more amenable to road construction. This course followed a vegetation type dominated by Eucalyptus *capillosa* (White Gum) and Allocasuarina *campestris* (Tammar). At both ends of this vegetation type occurs a gravel ridge, which has eroded to a flat clayey, sandy plateau and then a breakaway section, below which, occurs a sandy valley with mature old growth White Gum. These patches of White Gum are very old growth, with minimal understorey.

Desktop studies for the reserve identified a number of species listed earlier, which may occur in the area and are listed as Priority or Threatened species. The first visit to the Reserve was on the 1.10.20, where a Reconnaissance Survey was conducted in order to describe the vegetation types and document the species observed. The map below shows the track log of this initial survey. The survey, through this area was by foot and the log shows the area that was surveyed within the confines of the Reserve. Sections either side of this map were reported on separately in other sections of the report.

As this was initially a road side survey in support of a clearing permit application, vegetation immediately impacted by any proposed road work disturbance was a priority. The track log does not explore further into the Reserve than was necessary to report on the likely impact of proposed roadworks. All track logs chart the progress of two surveyors walking ten metres apart. Visibility was at least 10 metres and sometimes 50 metres in open country. Therefore, each track log is surveying a 20 metre strip as a minimum. Whilst the track log can be seen as following the road in some cases, this was often because the most diversity at the site was within those disturbed areas as a consequence of road maintenance activities. Species diversity declined the further from the road we surveyed and displayed a very common set of species.

RESULTS:

The northern portion of the track log above was White Gum dominated on the east side and York Gum dominated mostly on the west side. The gully running through the northern section was very much dominated by Melaleuca *marginata*, a dense and spreading prickly shrub to 2 metres and impenetrable by foot. This species was very dominant on the slopes leading down to all the white sand valleys. Halfway, the vegetation shifted to a plateau of clayey sand over coffee rock clay and was dominated by Allocasuarina campestris, Acacia *neurophylla* and sedges. This was generally the case until it reached a breakaway, below which, occurred sandy clay valleys dominated again by E. *capillosa* and A. *acuminata*.

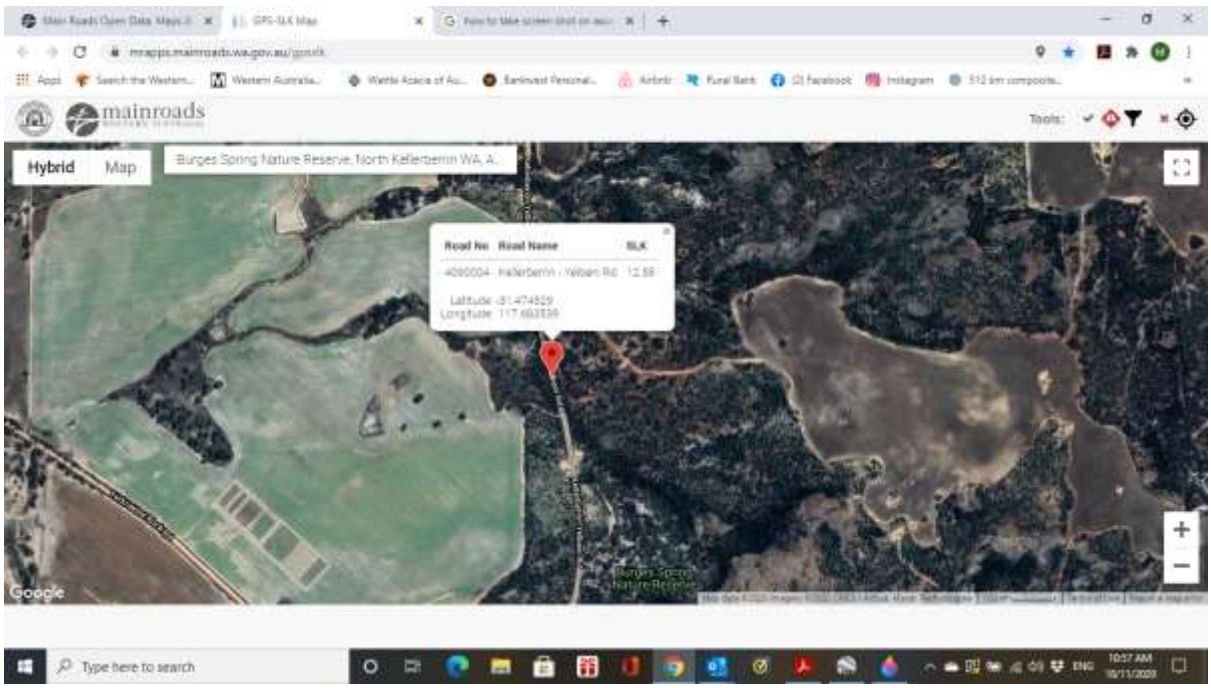
The species discovered during this initial survey are laid out in the following table.

	SLK 12.57 K -Y RD, Working south, on east side	
GENUS	**SPECIES**	**COMMON NAME**
Acacia	*verriculum*	Soft prickly
Acacia	*acuminata*	Jam
Acacia	*neurophylla*	Wodjil
Acacia	*colletioides*	Prickly
Acacia	*erinaceae*	Prickly
Acacia	*merrickiae*	P2
Allocasuarina	*campestris*	Tammar
Astroloma	*serratifolium*	Cranberry
Austrodanthonia	*caespetosa*	Wallaby grass
Austrostipa	*eleganissima*	Perennial grass, feather grass
Austrostipa	*scabra*	Spear grass

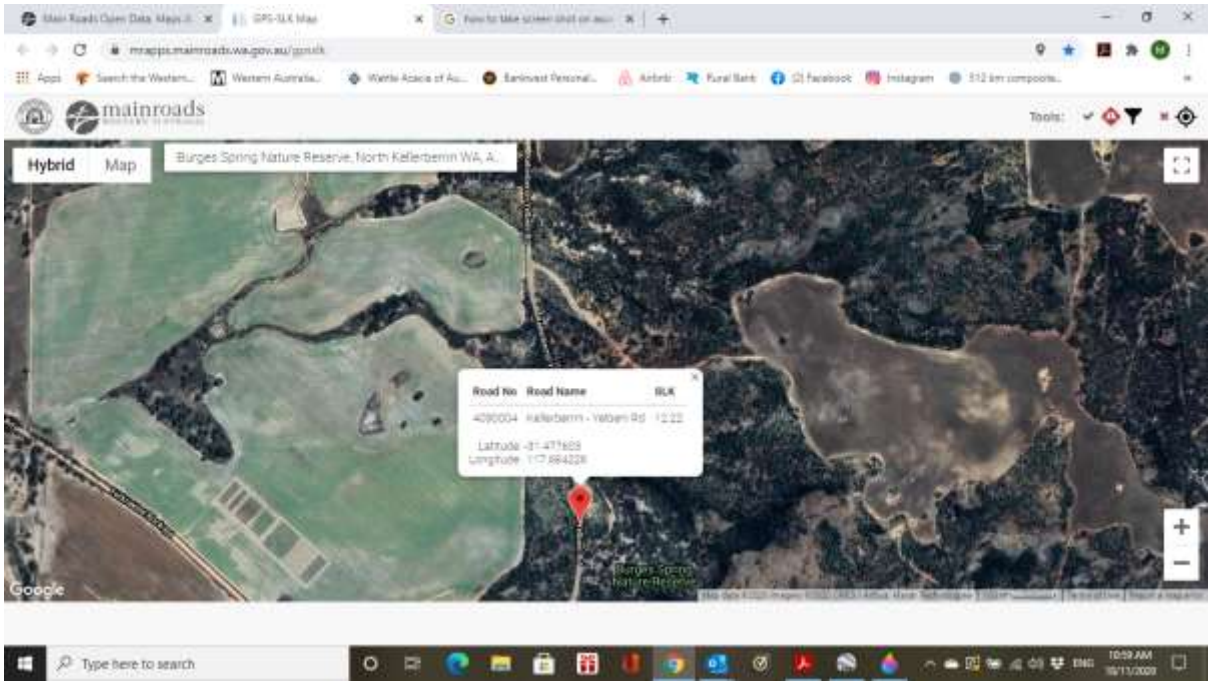
Borya	*species*	Pin cushion
Brunonia	*australis*	Blue annual
Chamexeros	*fimbriata*	Sedge
Chielianthes	*seiberi*	Rock fern
Dampiera	*lavandulaceae*	Blue dampiera
Dianella	*revoluta*	Flax
Dodonaea	*viscosa*	Hop bush
Enchylaena	*tomentosa*	Ruby saltbush
Eucalyptus	*capillosa*	Whitegum
Gastrolobium	*parviflorum*	Box poison
Glyschrocaryon	*aureum*	Pop bush
Grevillea	*paniculata*	Vanilla bush
Hakea	*recurva*	Stand back
Hyalasperma	*glutinosum*	
Lawrencella	*rosea*	Annual pink everlasting
Lepidabolus	*preissianus*	Sedge
Leptospermum	*erubescens*	Tee tree
Melaleuca	*marginata*	White flowering myrtle
Muhlenbeckea	*adpressa*	Strangler vine
Santalum	*acuminata*	Quandong
Santalum	*spicatum*	Sandalwood
Thysanotus	*species*	Climbing fringed lilly
Waitzia	*acuminata*	Golden Waitzia
	West side of road, Granite	
Callistemon	*phoeneceous*	Red bottlebrush
Ecdeiocoleae	*monostachya*	Thatch rush
Eucalyptus	*loxophleba ssp loxophleba*	York Gum
Melaleuca	*hamata*	Brushwood
Thelymitra	*aff. campanulata*	Blue sun orchid
Thryptomene	*cuspidata*	Teetree
Xanthorrhoea	*nana*	Grass tree
	SLK 12.31 SLK 12.10 Hockey sticks both sides	
Acacia	*acuminata*	Jam
Acacia	*verriculum*	Soft prickly
Acacia	*colletioides*	prickly
Allocasuarina	*campestris*	Tammar
Austrostipa	*elegantissima*	Feather grass
Chamexeros	*fimbriata*	sedge
Dampiera	*juncea*	Rushy dampiera
Dodonaea	*divaricata*	
Eremophila	*lehmanniana*	
Eucalyptus	*capillosa*	Whitegum
Gastrolobium	*obovatum*	

Hakea	*scoparia*	
Lepidabolus	*preissianus*	Sedge
Leptospermum	*erubescens*	Tee tree
Leucopogon	*amplectans*	P2
Melaleuca	*hamata*	Brushwood
Melaleuca	*conothamnoides*	Pom pom
Melaleuca	*radula*	mauve myrtle
Muhlenbeckea	*adpressa*	Strangler vine
Shoenus	*calacatus*	Donuts
Stylidium	*sp*	
Stylidium	*dielsianum*	Pink triggerplant spreading
Stylidium	*petiolare*	Grassy trigger plant
Thryptomene	*cuspidata*	
Verticordia	*picta*	Feather flower
Waitzia	*acuminata*	Golden waitzia

The following maps show the positioning of SLK data relative to the SLK numbers in the species list descriptions.



SLK 12.58



SLK 12.22

During the survey 2 P2 (Priority Threatened Species) were found, both of which were expected, due to the fact that they were mentioned in a Naturemap Desktop Search of Priority and Threatened flora previously found within 5 kilometres of the search area.

Acacia *merrickiae* was found in the vicinity of SLK 12.57 and Leucopogon *amplectans* was found in the vicinity of SLK 12.22. The Acacia was also found a further 200 metres east of 12.22.

Leucopogon amplectans, P2:

Leucopogon amplectans was found in a very small location on the east side of the road at SLK 12.22 or South 31.474620˚ and East 117.683625˚. The occurrence extends 30 metres east from the edge of the constructed road reserve and 100 metres along a north south direction. Eleven plants were found within this area and three plants are vulnerable to disturbance during planned roadworks. The map below places each plant in relation to the road. Plants 1,2 and 5 occur within the current spoil lines from maintenance grading.

The balance of the plant occurrences are well outside any proposed disturbance from road construction.

The plants are found on specific soils; shallow, white sandy clay over coffee rock. This is open shrub land dominated by Allocasuarina campestris and various sedges. It is a small plateau which falls away on a breakaway to deeper sandy white soils, dominated by mature Eucalyptus *capillosa* with very little understorey or second storey.

Acacia merrickiae, P2:

At SLK 12.56 or 31.474620s and 117.683625e, a population of Acacia *merrickiae* was found, consisting of 35 individual plants spread over an area 200 metres square. Apart from 33,34 and 35 on the following map, all plants were on the eastern side of the road.

The plants prefer open deep white sand over clay, among mature Eucalyptus *capillosa*. There is little or no understorey or secondary storey associated with the vegetation and the eucalypts dominate the vegetation. It is this environment that the Acacia enjoys and

appears to dislike any other competition. While surveying, the sight distance was at least 50m metres and the Acacias stood out at a distance, due to its' tall spindly form, distinct large leaves and lack of competition.

A further population was discovered 130 metres east of the Leucopogon population, below a breakaway and in exactly the same vegetation type as detailed for the larger population to the north. The map below shows the position of this occurrence of 6 plants (W11-W16).

DISCUSSION:

The survey of Burges Spring Reserve (R563) in the Shire of Kellerberrin was conducted over two separate days. The reconnaissance survey was completed on the first of October 2020 and the follow up detailed study was conducted on the 25th of November. During the interim, flora samples were sent to the Department of Biodiversity, Conservation and Attractions Herbarium for identification. Among other samples, Leucopogon *amplectans*, P2 and Acacia *merrickiae*, P2 were positively identified. As a result, the Detailed Survey conducted on 25th November was instituted to map the populations of Priority plants.

Leucopogon amplectans occurs in a small area adjacent to the road on the east side, with 3 plants vulnerable to disturbance from proposed roadworks. Acacia merrickiae occurs in two distinct populations at either end of the reserve. The larger population to the north is mostly removed from the clearing footprint, with 2 plants vulnerable to disturbance.

The Reserve was searched extensively, especially because of the existence of these plants and the map below shows the accumulated track logs from both survey visits. The third Priority species which is noted to occur in the vicinity of the reserve, Guichenotia seorsifolia, was not found during our surveys.

ROADSIDE SURVEY OUTSIDE BURGES SPRING RESERVE:

SLK 12 – 0

As outlined in the introduction, the road was driven and a log created in SLK metres. Each SLK point corresponds to a GPS co-ordinate and makes positioning whilst driving ideal for surveying long stretches of road. From Burges Springs, this survey heads south and east on the Yelbeni – Kellerberrin Rd to SLK 0 where it intersects with the Bencubbin – Kellerberrin Rd.

Apart from the small section either side of Yorkrakine Rock Rd, the road verges are very narrow on a road reserve width of 22 metres. In some places the road maintenance has extended to the fence which separates road reserve from private property. At best, 2-3 metres of road verge are left, with sporadic remnants left in poor or degraded condition. In some places Eucalypts have been planted over time, with most over 20 years old. They consist of non- provenance species popular with Landcare plantings of the time such as Eucalyptus torquata, camaldulensis, sargentii, gomphocephala and cladocalyx. In some places, endemic species such as Eucalyptus loxophleba and plennisima were also included in the plantings. These plantings were planted on the narrow verge in single lines. Occasionally they were extended into the paddock of private property to create a block planting.

In the Vegetation Condition columns, the quality of the vegetation is based on the Keighery Scale of reporting, moving through degraded, poor, good, very good, excellent and pristine. Degraded describes a total lack of remnant vegetation and pristine describes a vegetation patch which has a fully functioning ecosystem from overstorey, middle storey, ground covers and is not affected by invasive weeds or other influences which would down grade it such as waterlogging, secondary salinity or similar.

The log created below describes the state of the vegetation immediately preceding the SLK reading indicated, and because we were travelling from 12 to 0 the SLK readings are to be read in a descending order. The change in SLK numbers is associated with a change in soil type, landscape position or vegetation type or quality.

KELLERBERRIN - YELBENI RD SURVEY LOG SLK 12 - 0

SLK	LOG	VEG CONDITION
12	York Gum, Jam Woodland from Yorkrakine Rock Rd. Similar mix to Reserve.	Excellent
11.4	Changes to very narrow road reserve, adjacent to farmland. York Gum, Jam, A. lasiocalyx, Maireana brevifolia and weedy understorey.	Poor to Good
10.6	Paddock planting of York Gum on east side. 20 metre belt, roadside weeds.	Poor
10.1	Drain, salty on east side. Occasional York Gum.	Degraded
9.75	Deep drain ends	Degraded both sides
9.6	2 Salmon Gums over next km, with occasional Hakea preissii. Weeds	Degraded
8.8	Planted Cape Lilac	Poor
8.5	Salty valley, occasional York Gum.	Degraded
8.2	Occasional Salmon Gum, E. plenissima, E. capillosa, Jam, Melaleuca and Quandong. Eucalypts are only every 100 metres or so.	Poor to Good
7.1	Planted roadside, on east side, Coral, Tuart, sargentii and camaldulensis. All exotic.	Poor
6	Both sides planted to Tuart and Camaldulensis.	Poor
4.7	Clear both sides	Degraded
4.2	3 York Gums then nothing except weeds	Degraded
3.8	1 Salmon Gum, remnant York gum and jam with Bluebush understorey. 1 Tree every 30 m.	Degraded
3.14	Corner. 3 Salmons on west side, 1 on east corner. Weeds	Degraded
2.84	Line of Salmons on west side, 1 Gimlet at 2.64	Degraded
2.6	York gum, Jams and weeds	Poor
1.8	Salmon Gum south side	Degraded
1.6	Solid line of York Gum, Jam , still restricted to very narrow verge of 1-2 metres.	Poor to Good
1.28	Salty Creek. A. microbotrya and Jam both sides.	Poor
0.7	Occasional York gum and Jam on very narrow verge. Weedy.	Poor
0	Bencubbin - Kellerberrin Rd. Degraded	Degraded

On the 15th October, 2020 the roadside survey was completed for the section of road from Burges Spring Reserve at SLK 12.6 to SLK 22, where the Shire of Kellerberrin finishes. For this section the comments relate to the section of road ahead of the SLK reading. The roadside vegetation is generally similar to the first section of road described, in that it has narrow

road verges, with maintenance activities limiting the verge to a maximum of 2 to 3 metres and in some cases, activities extend to the fence.

KELLERBERRIN - YELBENI RD, VEG SURVEY SLK 12.6 TO SLK22	

SLK	LOG	VEGETATION CONDITION
12.6	Farmland on west, remnant on east side. See Reserve veg description	Excellent
13	Creekline, Whitgum vegetation on wide verge.	Excellent
13.2	Scott Rd. Uphill to gravel hill. No veg, just weeds.	Degraded
14.2	50 metres of mostly A. microbotrya, weeds	Degraded
14.36	Farmyard, planted E. camaldulensis	Degraded
14.5	Small remnant on farm of E. erythronema, weedy undergrowth.	Good
14.6	3 White gums, not being cleared, weedy and bare otherwise.	Poor
15.1	Remnant Allocasuarina acutivalvis on west side for 100m.	Good
15.2	Thin line of mallees on east side	Poor
15.6	Sparse secondary species, Leptospermum erubescens, Hakea preissii, black G. hookeriana, A. microbotrya, weedy understorey for 1.5 km	Poor to Good
16.9	Some York gums every 100m over weedy understorey	Poor
17.5	Planted camaldulensis on east side	Poor to Good
17.7	Camaldulensis both sides, no remnant, weeds.	Poor to Good
18.3	Quandongs east side with small patch of E. erythronema	Poor
18.6	Salty creek. No remnant apart from saltbush and weeds.	Poor
20	E. capillosa patch for 2 km. Sparse secondary species, plenty of weeds. Not wide enough or dense enough cover to make a TEC patch (3ha). Wide road reserve of about 20 metres.	Good

DISCUSSION:

From the logs which describe the vegetation condition either side of Burges Spring Reserve, it can be seen that narrow road verges are the norm, with barely enough verge to sustain very degraded to poor quality remnant vegetation. Remnant Eucalypts are sparse and occur intermittently with little in the way of Secondary or Understory vegetation. Secondary vegetation such as Acacias, Melaleucas, Hakeas and various saltbush species occur sporadically but are not supported by any understory to improve their vegetation quality score, due to the dominance of agricultural weeds of every description.

The only vegetation which would be described as good quality or better is within the Reserve and on private land immediately adjacent to the Reserve, Between Yorkrakine Rock Rd and Scott Rd. Two Priority 2 species have been identified and their extent mapped. Both Acacia merrickiae and Leucopogon *amplectans* were found within the proposed clearing footprint. The Acacia has 2 plants vulnerable to disturbance of 35 plants plotted and the Leucopogon has 3 plants vulnerable of 11 plants found and plotted.

The verges at Burges Spring are on the whole free of introduced weeds, apart from the creekline at the north end of the Reserve, on the western side where it abuts granite. Everywhere else is in a very healthy state. The area between the Leucopogon occurrence and the smaller Acacia occurrence has had a disturbance where an historical attempt to drain water has been made. This has not, however encouraged weeds and has generally settled down without further erosion, but still free of any vegetation. The scar can be seen on the last photo.

I describe the health of the area of the Reserve which has been surveyed as Excellent to Pristine. The only reason it doesn't rate as pristine is the small tracks leading to paddocks and disturbances along the roadside during road maintenance.

CONCLUSION:

Apart from Burges Spring Reserve, the surveyed roadsides from SLK 0 to SLK 22 are narrow road reserves of up to 3 metres wide on either side at their maximum and down to no verge at their worst, where maintenance grading and drainage works have left no verge at all.

The quality of remnant vegetation is poor on average, due to the presence of agricultural weeds as the dominant understory. Mid story species are usually intermittent with no other remnants to support them. Upper story remnant species are again intermittent and existing as single lines of trees.

Much of the Eucalypt lines are not local provenance species but were planted over 20 years ago during Landcare plantings. They are again in single lines with little mid or lower story species to support them. Weeds proliferate in these areas.

In the short stretch of under 1 kilometre at Burges Spring Reserve, the vegetation undergoes a transformation to Excellent remnant vegetation, as the road winds through a mostly granitic landscape, by following a white clay- based soil type, most suited to road building. Two Priority 2 species were found in this survey area, with both having small numbers of individual plants vulnerable to road widening activities. Through this area in particular, a sensitive hand will be required to engineer the road with minimal impact to the ecology.

END