GOVERNMENT OF WESTERN AUSTRALIA

Department of Environment Regulation

Feedback form

Draft guideline: A guide to preparing revegetation plans for clearing permits under Part V of the *Environmental Protection Act 1986*

Respondent information

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Why are you/your business or association interested in the draft guideline titled *'A guide to preparing revegetation plan for clearing permits* under Part V of the *Environmental Protection Act 1986'*?

Main Roads submits numerous revegetation plans to DER annually, primarily for revegetation of temporary clearing associated with material extraction areas, temporary access tracks, and to a lesser degree, revegetation associated with offset areas. As such, Main Roads is a stakeholder in the review of the draft document, and changes to the guideline will have significant implications on Main Roads resources.

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Feedback on the draft guideline: A guide to preparing revegetation plans for clearing permits

Are there any parts of the draft guideline where the requirements are not clear? Please outline in the text box below, indicating the page, section number and title for each part being referred to.

Specific comment relating to individual items:

Definitions p1
Environmental specialist – suggest remove 'this permit'

Quadrat – should include reference to appropriate dimensions as per the new EPA/DPaW Flora & Veg Technical Guide (2015 rev July 2016) and should be marked and measured; otherwise it's a releve and not appropriate for quantifiable data analysis

Qualified disease interpreter – definition is inconsistent with the Dieback Survey definition which includes the use of the term 'environmental specialist'

Vegetation condition – should reference the most contemporary guidance - i.e. the new EPA/DPaW Flora & Veg Technical Guide (2015 rev July 2016)

5.3.2 Data to collect p6
Site Vs Quadrat data collection. Quadrats are used as a surrogate for sampling within vegetation units across a site. Generally opportunistic collections and notes are made from releves or site notes to assist with vegetation unit and condition mapping. From Table1 it suggests that the species list should be in order of structural component and dominance; but if a number of vegetation types are present this will lead to useless data – this level of detail is usually presented already in the quadrat data.

5.3.4 Quadrat quantity, placement and size p 8
(paragraph beginning) "Further information……." should reference the new EPA/DPaW Flora Veg Tech Guide which is more contemporary and provides a more specific level of details in regards to quadrat replication/placement/etc

5.3.6 Weeds and Diseases p8
This section states that by having data on weeds in the reference site will assist in "determining the management techniques within the revegetation type". What it actually will do is inform completion criteria; particularly in sites where there is an existing weed presence, such as in pastoral lease areas or adjacent to disturbed areas where a high likelihood of weeds occurring in the revegetation site can be expected. Not necessarily however, the same suite of weeds. Management techniques should be suited to the results of the annual monitoring which will note the density and types of weeds present. These early colonising weeds can be quite different to weed occurrence within existing climax vegetation.

5.4 Completion Criteria
"Revegetation is generally considered complete once the completion criteria have been met, maintained and monitored for a minimum of two years."
This is a significant shift in approach. Previously revegetation responsibility was complete once completion criteria was achieved and/or after a period of 10 years of actions and monitoring. There are considerable implications in cost and resources should seasonal conditions or other factor occur post-achievement of completion.

5.4.1 Table 3: (A(III)): This is superfluous as it is reiterated in (B(i))

5.4.1 Table 3: (E) column 4: should be: no more than 15.75%. (Which is 5% greater than the reference site, as stated in column 3.

5.5.8 Mulch – the use of the term does not encompass the range of mulch types and their purposes that can be applied to a revegetation area. (see also 'Mulching' in the definitions section)

6.1.1. & 6.1.2. Quadrats np
Table 5 suggests that species richness should be collected at both the site and quadrat level. Quadrats are a surrogate for sampling within a whole site; particularly within large sites. Further, in the primary

years of monitoring, with only cotyledon leaves present, it will be very difficult to discern beyond plant family level. Also, species recorded opportunistically across a site are not suitable for use in quantitative data analysis.

Why, in addition to monitoring quadrats, are permanent monitoring points to be established? The paragraph further refers the reader to Guidance 51 – but this is for terrestrial surveys, not for monitoring. No reasoning or context is provided.

6.3 Data Analysis np
The purpose for overly complicating data analysis through multivariate analysis is not explained; nor does is seem to marry against the completion criteria. Quadrat monitoring data is very simple (univariate) species data tracked over time to measure a positive trajectory towards completion criteria and easily represented graphically; most sites would not require a higher level of data interrogation/analysis.

Appendix A np
Reference site floristic data collection/Targets and completion criteria – both refer to different vegetation units being revegetated – an unlikely outcome following revegetation (natural) of a material extraction pit

Please provide other comments or suggestions in the text box below, indicating the page, section number and title for each part being referred to.

Overarching comments on the draft guideline include that the document appears to:

1. Be strongly focussed on the southwest botanical province; with little reference to the widely varying techniques used across the State both for site establishment, recruitment of species (augmented or natural) and site management. The Interzone, Eremaean and Northern Provinces make up two-thirds of the State and a major source of revegetation activities (based on material extraction area) for Main Roads. Appendix F cites two examples of revegetation budgets – both Southwest Botanical Province.

2. Be written from the perspective that vegetation communities are static and if cleared can be returned to its former state with discreet vegetation units. Therefore if you collect baseline data you should be able to revegetate to the same structure, density and diversity. Even with a naturally occurring event, such as fire, this may never happen. The document doesn't discuss the considerable constraints relating to the large number of species that do not come back in revegetated landscapes; recalcitrant species or species whose dominancy mechanisms are unknown. No State-wide information on revegetation success are discussed or offered; anecdotally revegetation of disturbed areas is fraught with difficulty and they never resemble pre-disturbance climax communities. Some naturally occurring plant communities are quite resilient; others not so. The State's knowledge in regards to revegetation success is quite limited to studies on Jarrah Forest (ALCOA), banksia woodlands (Rocla) and some kwongan heaths (RGC, Tronox). Returning dominant species such as mulga and spinifex in Northern Provinces has not been successful to date even though these are ubiquitous components of the floristic landscape.

3. Lack distinction between revegetation encouraged through natural recruitment (Interzone, Eremaean and Northern Provinces) and augmented revegetation (seeding/planting) (southwest Province). Further, the dynamic process of natural recruitment has not been fully addressed and the reliance on prevailing climatic conditions following early colonisation to a successful climax community should be acknowledged. Depending on the revegetation types (and Province) you have two vastly different scenarios; in one case you have control over the outcome depending on the seed or seedlings you select and plant; whilst the other will be a direct result of topsoil, mulch propagules, seed bank and climatic conditions (especially during the initial establishment years). Even in sites which are seeded, revegetation is limited by the seed that can be sourced and further compounded by the ability to germinate the seed in situ. It must also be taken into consideration the difficultly in recruiting a wide suite of native flora from seed due to the dormancy mechanisms which prevent germination.

4. The revegetation of material extraction pits, post-extraction is deemed 'temporary clearing'. It should be recognised that the material pit post-extraction is a completely different site to what was once there. The top soil is stockpiled for years and substrates are removed; following ripping and respread of topsoil and mulch (if available) it should be acknowledged that there is very low potential for the plants that establish to even remotely resemble that pre-disturbance vegetation community. The soil will have different physical and chemical properties and will be below the natural soil elevation level. The ecology of the site; soil properties, biota, physical and chemical properties and hydrology are altered and therefore if revegetated with the suite of flora that previously existed there, is highly unlikely to recolonise or perpetuate if seeded/planted. To presume that the resultant revegetation will even approach 50% similarity to vegetation surrounding the site, might be too high an expectation.