

Appendix 69 Completion Criteria for 2016 Onwards

Appendix A: Completion Criteria for 2016 onwards – Current era rehabilitation

1 PLANNING

1.1 LANDUSE AND MANAGEMENT PRIORITY

Criteria and intent	Guidelines for acceptance	Standard	Corrective action ¹
1.1.1 Identification of landuse A landuse plan has been agreed with government.	All disturbance activities proposed by Alcoa on State forest and other Parks and Wildlife managed lands are compliant with legislation, meet the requirements of the Forest Management plan 2014 -2023 and will be carried out within approved guidelines for management.	Rehabilitation schedules, prescriptions and standards to be approved by MMPLG.	Rehabilitation schedules, prescriptions and standards for Alcoa's mining operations are identified in the Mining Management Program that is submitted to the MMPLG on an annual basis. Details are specified in the Alcoa/Parks and Wildlife Working Arrangements and the Water Working Arrangements,
	The Minister for State Development, on advice from the MMPLG, approves Five Year Mine Plans and Mining and Management Programs each year. The submission includes mining and rehabilitation programs.	Rehabilitation prescriptions are consistent with the designated multiple landuse objectives for the jarrah forest.	Five year mine plan includes rehabilitation schedule. Plans have priority landuses identified and management plan agreed through the MMPLG (e.g. recreation, heritage, water resource).

1.2 EXISTING ENVIRONMENT

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
1.2.1 Dieback mapping Dieback mapping has been completed prior to any mining activity.	Dieback mapping to be completed prior to disturbance activities. Dieback mapping should include the mining footprint and catchment area downslope of mining areas.	Area mapped for dieback according to procedures outlined in the Alcoa/Parks and Wildlife Working Arrangements.	Dieback lines may need to be re-checked in accordance with current Parks and Wildlife Hygiene Management Standards.
1.2.2 Flora and fauna surveys Flora surveys and fauna assessments have been completed prior to clearing.	Plant species and community management plans have been prepared and endorsed by Parks and Wildlife for State and Federally listed flora species and Threatened Ecological Communities.	Field flora surveys have been completed to agreed standards as set in the Alcoa/Parks and Wildlife Working Arrangements for all areas intended to be cleared for mining or infrastructure.	Undertake survey to agreed standards.
	Species management plans have been developed for rare and threatened fauna species that have been identified in the crusher region.	Pre-mine fauna assessment and targeted field surveys have been completed to agreed joint EPA/Parks and Wildlife guidance standards (Hyder et al. 2010).	Undertake survey to agreed standards.

¹ Unless otherwise stated, the outcomes required from the 'Corrective action' will be the responsibility of, and be undertaken by, Alcoa.

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Criteria and intent	Guidelines for acceptance	Standard	Corrective action
1.2.3 Heritage surveys Significant cultural heritage values will be conserved.	Staff are able to recognise cultural heritage values. Heritage surveys for aboriginal sites have been completed by a suitably qualified assessor ahead of clearing.	Staff and contractors will be provided with heritage training to be able to identify and report potential sites of significance.	
		Identified sites are marked in the field (if appropriate) and avoided, if possible. Where sites cannot be avoided, permission to disturb them must be sought from the Department of Aboriginal Affairs (DAA).	Remedial action for disturbed sites will be agreed between DIA / local Aboriginal groups and Alcoa as required.
	Non-indigenous Heritage review to be completed ahead of clearing.	The significance of places will be determined in consultation with the Heritage Council of Western Australia (HCWA), Australian Heritage Council (AHC), National Trust (WA Branch) and relevant local government authorities.	Remedial action for significant places that have been disturbed will be agreed between Heritage Council of WA/ Alcoa and Parks and Wildlife, as required.
		Places of high cultural significance will be conserved, unless permission to disturb them is provided by HCWA. Where required by HCWA a Conservation Plan will be prepared for the heritage place.	
		Parks and Wildlife has been advised of all new cultural heritage sites or places that have been identified within the mining region.	

1.3 SUSTAINABLE GROWTH AND DEVELOPMENT

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
1.3.1 Rehabilitation planning A rehabilitation plan or procedures has been developed for the mining region.	Rehabilitation plans or procedures exist according to prescriptions outlined in the Alcoa/Parks and Wildlife Working Arrangements. Rehabilitation schedule is included with the 5 year mine plan and soil movement plans are available prior to the rehabilitation season commencing.	Prescriptions for rehabilitation planning outlined in the Alcoa / Parks and Wildlife Working Arrangements are implemented. Plans for movement and return of topsoil are in accordance with the Alcoa / Parks and Wildlife Working Arrangements.	Prescriptions may need to be altered according to site specific requirements, advances in knowledge and / or continual improvement outcomes.

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1.4 INTEGRATED LANDSCAPE

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
1.4.1 Visual An assessment of visual aspects of mining has been made for the crusher region.	The visual aspects of mining have been considered in Mine Planning, specifically the view of mining operations from public access areas. The Minister for State Development, on advice from the MMPLG, approves on an annual basis the Mining and Management Programs (MMPs), i.e. Five Year Mine Plans that contain mining and rehabilitation programs.	Programs to manage visual aspects of the mining, where relevant, are included in the annual Mining and Management Programs for approval through the MMPLG.	Implementation of aesthetic programs for prescribed areas.
1.4.2 Accessibility Access requirements for the crusher region have been agreed with stakeholders.	<p>Mine Access plans are reviewed annually against the Forest Access plan and agreed with Parks and Wildlife and the Water Corporation. Access also discussed with neighbours and local government, as appropriate, during Mine Management Programs consultation.</p> <p>The Minister for State Development, on advice from the MMPLG, approves on an annual basis the Mining and Management Programs (MMPs), i.e. Five Year Mine Plans.</p>	Agreed access requirements are developed in accordance with Parks and Wildlife Road Standards.	Construct / upgrade or provide access as per agreed plans and Parks and Wildlife Road Standards.

1.5 INTEGRATED MANAGEMENT

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
1.5.1 Dieback forest rehabilitation (DFR) An annual DFR program has been agreed with Parks and Wildlife.	<p>Areas included in the annual DFR program will be endorsed by Alcoa and Parks and Wildlife</p> <p>The Parks and Wildlife District Mining Liaison Officer must sign record sheets that indicate DFR treatment need not be carried out in an area which is otherwise eligible.</p>	<p>Areas within the annual plan meet the selection criteria for DFR treatment and are rehabilitated according to prescriptions consistent with the objectives in the Alcoa/Parks and Wildlife Working Arrangements.</p>	<p>Areas will be treated as per the agreed prescription and objectives in the Working Arrangements.</p>
1.5.2 Fire Fire management criteria for the mining region have been identified and addressed by Parks and Wildlife and Alcoa.	<p>Annual and rolling five year fire management plans have been jointly prepared by Parks and Wildlife and Alcoa. These plans are based on updated fire risk assessments undertaken for each mining region</p> <p>The fire management plan to be reviewed annually and approved by the Parks and Wildlife Regional Manager.</p>	<p>The plan addresses the long term requirements of fire management of the region including:</p> <ul style="list-style-type: none"> • Protection of rehabilitation from fire during the fire sensitive stage. • Reduction of fuel level in the forest to reduce the risk of bushfire. • Reduction of fire risk in the rehabilitation to allow integration with un-mined forest management. 	<p>Burning, silvicultural treatment or mechanical flattening of understorey may be considered as outlined in the plan.</p>

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2 REHABILITATION EARTHWORKS (LANDFORM AND SOIL RE-ESTABLISHMENT)

2.1 INTEGRATED LANDSCAPE

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
2.1.1 Landscape design The mine pit areas are landscaped to be stable and to blend in with the surrounding forest.	Landscaping must be completed to ensure effective surface water management. Landscape design will not cause an impediment to access for Parks and Wildlife's operations or be an ongoing financial or management liability. Self-certification by Alcoa annually and / or inspection by Parks and Wildlife confirm landscape design is acceptable. Landform design that meets the standard will be deemed acceptable unless Parks and Wildlife writes to Alcoa within three months of self-certification to advise otherwise.	Slopes must always be less than 18 degrees. No landscaped pit is to have a slope greater than 15 degrees for more than 20 metres unless it is on contour of the surrounding forest floor.	Alcoa to provide documentation and advice to Parks and Wildlife, where self-certification has resulted in non-standard outcomes. Completion Criteria checklists will be completed by Alcoa and may be checked by Parks and Wildlife. If Parks and Wildlife finds that any rework is required based on occasional random inspections then they will state this in writing to Alcoa within 3 months of the completed inspection. Alcoa will undertake remedial works to ensure areas meet the landscape design standard.

2.2 SUSTAINABLE GROWTH AND DEVELOPMENT

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
2.2.1 Rehabilitation establishment (a) Waste islands will be effectively rehabilitated	Waste islands will have caprock shattered and topsoil spread and scarified to prevent impeding vehicular or rubber tyred machine for fire access.	No area greater than 0.1 of a hectare has unbroken caprock. Trafficability to agreed Alcoa/Parks and Wildlife Working Arrangements.	Areas of caprock not broken of greater than 0.1 hectares in area will be broken and revegetated.
(b) There is an adequate cover of topsoil across the rehabilitated area.	Topsoil return and coverage is uniform within each individual rehabilitated pit.	Direct return (or agreed surrogates) topsoil is spread over the rehabilitated area. No area >0.1 ha has no topsoil coverage. The cumulative area without topsoil does not exceed 10% of the rehabilitated pit.	A combination of any or of all the following could be applied to bare areas: topsoil (or agreed surrogate), seeds, plants or fertiliser.

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Criteria and intent	Guidelines for acceptance	Standard	Corrective action
(c) The rehabilitated area has adequate ground fauna habitat.	Self-certification by Alcoa annually and inspection by Parks and Wildlife confirms rehabilitation has adequate ground habitat material.	Rehabilitation will include one constructed habitat per 2 hectares. Habitat requirements are detailed in the Alcoa/Parks and Wildlife Working Arrangements.	Additional fauna habitat may be added provided they do not compromise the water control on the site.
(d) The area has been contour ripped.	Ripping must be undertaken as per criteria established in Alcoa/Parks and Wildlife Working arrangements. Self-certification by Alcoa annually and inspection by Parks and Wildlife (where applicable) confirms rehabilitation ripping is acceptable. Ripping that meets the standard is deemed acceptable unless Parks and Wildlife writes to Alcoa within three months of self-certification to advise otherwise. Ripping does not prevent access for fire line construction by front end loader.	No uncontrolled water runoff or unacceptable soil erosion in or adjoining the pit. Unacceptable erosion is that which: <ul style="list-style-type: none"> restricts access through the area by 4 wheel drive vehicles is unstable and degrading , or will compromise landuse objectives. Gully erosion will not exceed: <ul style="list-style-type: none"> 30cm depth and 30cm width , and 100m in length areas of unintended deposition >0.1 ha These areas will be identified as part of 9 month monitoring	Alcoa to provide documentation and advice to Parks and Wildlife, where self-certification has resulted in non-standard outcomes. Rehabilitated areas that do not meet the standard will be rehabilitated.
(e) The pit floor has been ripped.	Ripping must be undertaken as per criteria established in Alcoa/Parks and Wildlife Working arrangements. Self-certification by Alcoa annually and inspection by Parks and Wildlife (where applicable) confirms pit floor ripping is acceptable.	Pre-rip to be undertaken in accordance with Alcoa/Parks and Wildlife Working arrangements. Rip compacted pit floor to at least 1.2 m, excluding batters and waste islands.	Rehabilitated areas that do not meet the standard will be ripped again and rehabilitated.

2.3 CATCHMENT PROTECTION

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
2.3.1 Catchment Protection Rehabilitated areas conform to water catchment management guidelines.	Rehabilitated surfaces are stable and water quality standards are met.	Turbidity monitoring is carried out according to the Water Working Arrangements. Areas will be stable with no evidence of recent erosion which would compromise stream water quality. There are no areas greater than 0.1 hectare with less than 0.5 native plants per square metre as identified from aerial photography or ground truthing on a 5-yearly basis.	Areas of 0.1 hectares or greater not stocked at the rate of 0.5 native plants per square metre will be inspected with Parks and Wildlife and reseeded or planted if required to meet the overall rehabilitation objective (Section 3 of the Completion Criteria Certification Process Overview document)

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3 EARLY ESTABLISHMENT - FIRST 5 YEARS

3.1 VEGETATION ESTABLISHMENT

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
3.1.1 Establishment of overstorey (a) The overstorey stocking of both jarrah and marri to meet standards.	<p>Rehabilitated areas must have a stocking rate which will meet designated land uses (See Attachment 1).</p> <p>Alcoa must submit 9-month monitoring data to Parks and Wildlife annually. Parks and Wildlife must review and advise Alcoa of acceptance or request corrective actions.</p> <p>Establishment of overstorey that have achieved the standard will be deemed acceptable unless Parks and Wildlife writes to Alcoa within three months of self-certification unless otherwise agreed</p>	<p>The average number of stems/ha within a pit (9 month monitoring data):</p> <ul style="list-style-type: none"> Minimum: 600 eucalypt stems/ha Maximum: 1400 eucalypt stems/ha Target: 1000 eucalypt stems/ha (except haul roads and pits < 2 ha). Minimum: 200 marri stems/ha Minimum: 150 jarrah stems/ha. <p>No rehabilitated sites (>2ha in size) have areas >0.5ha (as identified from either 9mth monitoring or subsequent review of aerial imagery at~5yrs of age) with <100 stems/ha.</p>	<p>Alcoa to provide documentation and advice to Parks and Wildlife, where self-certification has resulted in outcomes that do not meet the standard.</p> <p>Rehabilitated areas that do not meet the minimum standard will be replanted or reseeded by Alcoa with minimal delay (once conditions are suitable) to enable the minimum standard to be achieved.</p> <p>Rehabilitated areas that exceed the maximum standard will be inspected by Parks and Wildlife and may be thinned by Alcoa to reduce tree density back to the identified acceptable range, as required.</p>
3.1.2 Establishment of understorey (a) There is an adequate legume density early in regeneration.	<p>Alcoa must submit 9-month monitoring data to Parks and Wildlife annually. Parks and Wildlife must review and advise Alcoa of acceptance or request corrective actions.</p> <p>Vegetation establishment monitoring to occur as defined in the Alcoa/Parks and Wildlife Working Arrangements.</p>	<p>Minimum legumes 0.5 per square metre averaged over a pit assessed at 9-months. Monitoring as defined in the Alcoa/Parks and Wildlife Working Arrangements.</p>	<p>Rehabilitated areas that do not meet the standard will be inspected by Parks and Wildlife and planted or seeded if required and remonitored.</p>
(b) There is adequate plant species richness.	<p>Areas to have a representative number of forest species present.</p> <p>Alcoa must submit 15-month species richness and density monitoring data to Parks and Wildlife annually. Parks and Wildlife must review and advise Alcoa of acceptance or request corrective actions.</p> <p>Monitoring at 15 months and the calculation of species richness and density is undertaken as defined in the Alcoa/Parks and Wildlife Working Arrangements.</p> <p>A joint decision should be made about treatment of pods that have not met the criteria and whether a total rework is justified</p>	<p>The species richness in monitoring plots in rehabilitated areas to be ≥60% of the average species richness in monitoring plots established in unmined forest. The assessment in rehabilitated areas is based on monitoring at 15months.</p> <p>The 15-month monitoring of rehabilitated areas and the calculation of species richness is undertaken as defined in the Alcoa/Parks and Wildlife Working Arrangements.</p>	<p>Rehabilitated areas that do not meet the standard will be inspected by Parks and Wildlife and planted or seeded if required and remonitored.</p>

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(c) There is an adequate density of resprouter species, as defined by Bell (2001).	Monitoring at 15 months and the calculation of resprouter density is undertaken as defined in the Alcoa/Parks and Wildlife Working Arrangements.	Minimum number of surviving resprouter species will be 200 plants/ha.	Rehabilitated areas that do not meet the standard will be inspected by Parks and Wildlife and replanted if required and re-monitored.

3.2 RESILIENCE OF VEGETATION

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
3.2.1 Weeds No evidence that significant introductions of new weed species* (environmental and declared) are persisting or that weed competition is restraining sustainable development of native species. <small>**A naturalised non-indigenous plant species, that adversely affects the health, survival or regeneration of local provenance–indigenous plant species in Alcoa's rehabilitation and unmined forest</small>	Alcoa must submit 9-month monitoring data and maps of weed presence, including any new Declared or environmental weeds the Alcoa/Parks and Wildlife Working Arrangements), to Parks and Wildlife annually. Alcoa must seek Parks and Wildlife advice on appropriate treatment, if any, and indicate where treatment has occurred. Parks and Wildlife must review and advise Alcoa of acceptance or request further corrective actions within three months of self-certification.	Vegetation establishment monitoring is undertaken as defined in the Alcoa/Parks and Wildlife Working Arrangements and indicates that the intent of this criteria is being met.	Rehabilitated areas that do not meet the standard will be inspected by Parks and Wildlife and treated if required. Declared weeds treated as per DAFWA or appropriate weed DMA advice.

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4 VEGETATION 12 YEARS AND OLDER²

4.1 RESILIENCE OF VEGETATION

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
4.1.1 Resilience of fire affected rehabilitation The rehabilitation is capable of persisting at the required standard following bushfire	Sufficient stems are available following the fire to provide a stocked stand. Actions are consistent with the current version of the Alcoa/ Parks and Wildlife Working Arrangements.	A minimum of 300 stems/ha including; A minimum of 150 stems/ha Jarrah; and a minimum of 45 stems/ha Marri.	Survey for survivorship. Treatments may be needed such as reseeding and planting areas if they do not meet the standard.
4.1.2 Dieback Overstorey Tree species not susceptible to dieback	Tree species not susceptible to dieback are present at an adequate stocking rate.	Minimum 200 marri stems/ha at 9 months monitoring.	Plant marri as required.
4.1.3 Other forest diseases Rehabilitation is not preferentially attacked by non-dieback forest diseases.	An assessment has been made of the extent and severity of any damage-non dieback or forest disease- (crown or bole damage) and whether the rehabilitation is being selectively damaged in the crusher region.	The disease expression in rehabilitation is no greater than in the un-mined forest.	Discuss potential responses with Parks and Wildlife and implement an agreed response.
4.1.4 Insects Rehabilitation is not preferentially attacked by insects	An assessment has been made of the extent and severity of any insect damage (crown or bole damage) and whether the rehabilitation is being selectively attacked in the crusher region.	The infestation of rehabilitation by insects is no greater than in the un-mined forest.	Map and assess sites showing signs of major insect damage. Discuss potential responses with Parks and Wildlife Senior Silviculturist and implement agreed response.
4.1.4 Drought	Mining rehabilitation areas are not showing evidence of being preferentially affected by drought.	There is no obvious variation or differential to unmined forest.	If preferentially affected then determine response with Parks and Wildlife

² Rehabilitation areas younger than 12 years of age that Alcoa proposes to hand back to the State, must meet the 5 year standards (as per Section 3 Early Establishment – First 5 years) and demonstrate, using plot monitoring data that the rehabilitation is on a trajectory to achieve 12 years standards as per Section 4 – Vegetation 12 Years and Older.

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4.2 LANDUSE (INCLUDING TIMBER PRODUCTION)

Criteria and intent	Guidelines for acceptance	Standard	Corrective action
4.2.1 Timber production There is an adequate density of both jarrah and marri to meet timber production requirements. The timber production landuse criteria only apply to the percentage of rehabilitated area that had a timber production landuse prior to mining, i.e. if 15% of the area mined had no timber production potential, then only 85% of the rehabilitated area needs to meet the timber production landuse criteria.	Areas capable of producing sawlogs	The average number of stems/ha: <ul style="list-style-type: none"> Minimum: 500 eucalypt stems/ha Maximum: 1300 eucalypt stems/ha Target: 900 eucalypt stems/ha (except haul roads and pits <2 ha). Minimum: 200 marri stems/ha Minimum: 150 jarrah stems/ha. Based on review of aerial imagery, no rehabilitated sites (>2ha in size) have areas >0.5ha with <100 stems/ha At time of hand back the subject region has a minimum of 250 stems/ha combined total of Jarrah/Marri with the potential to produce a straight bole with a minimum of 3 m of potential future sawlog (excludes stump height). Evidence provided from plot monitoring, research studies, random sampling and aerial photography will be used to estimate density and potential bole length.	Silvicultural treatment may be required for implementation by Alcoa. Required treatments will be negotiated with Alcoa and Parks and Wildlife to meet the overall rehabilitation objective (Section 3 of the Completion Criteria Certification Process Overview document).
4.2.2 Proposals to carry out thinning on rehabilitated mine sites Where a proposal is made by a proponent to thin rehabilitated stands, this will be considered by Alcoa and Parks and Wildlife	Heavily stocked stands may, be thinned by an agreed proponent to encourage sawlog production or achieve other management objectives	Stands above the required minimum may be thinned to 300 stems/ha at any time after age 15. The densest stands will be preferentially targeted for prescribed burning or silvicultural thinning, if appropriate or applicable, through the use of Catchment Management Plans as provided for in the Forest Management Plan 2014-2023 and set out in the Working Arrangements	Silvicultural treatment may be required. Required treatments will be negotiated with Alcoa and Parks and Wildlife and implemented by the proponent.
4.2.3 Management of understorey There is an adequate understorey layer in the regenerated pit.	Understorey vegetation meets the expected species richness, density and cover.	Evidence from permanent monitoring plots, and research trials that understorey cover density and richness are within the respective ranges observed in forest reference sites.	Rehabilitated areas that do not meet the expectations will be inspected by Parks and Wildlife and a plan for remedial action will be negotiated with Alcoa and Parks and Wildlife.
4.2.4 Management of Fire Risk The rehabilitation has been prescribed burnt (at least once) or a wildfire has burnt the area, or the area is on an approved Parks and Wildlife burning plan.	The rehabilitation has been burnt by prescribed fire or wildfire or the area is on an approved Parks and Wildlife burning plan.	100% of the rehabilitated areas have received a prescribed fire or a wildfire or the area is on an approved Parks and Wildlife burning plan.	Alcoa will provide Parks and Wildlife with a provision to cover the cost of prescribed fires for all unburnt rehabilitated areas.

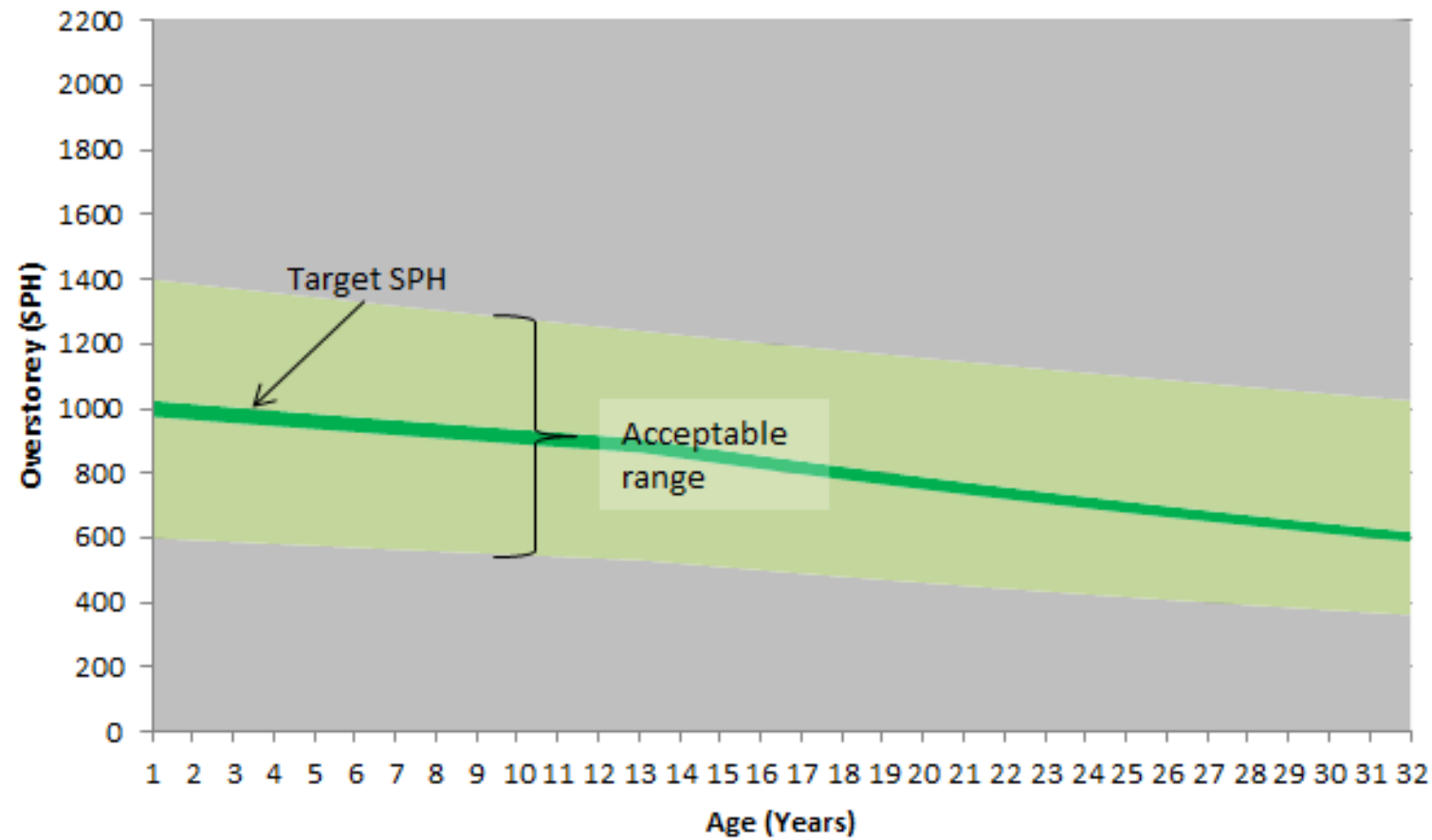
Attachment 1

Review completed and approved by MMPLG (June 2015)

Silvicultural target range from 9 month monitoring to 30 years

Returning the overstorey to rehabilitated areas is an important step in restoring a self-sustaining ecosystem. The stand stocking (usually expressed in terms of the number of stems per hectare) of restored overstorey needs to be high enough to satisfy timber production values, but not so high as to exclude understorey species, or compromise the health of overstorey through competition effects. A target range of overstorey stocking (Figure 1) is used in recognition that it is acceptable to have some areas that are understocked or overstocked (simulates the natural variation that occurs within native jarrah marri forests, but most of the rehabilitated areas should be stocked within the target range).

Figure 1. The target stocking range for rehabilitated areas.



When rehabilitated areas are accepted back by the State, the accepted area may contain a mosaic of varying rehabilitation ages. For this reason, the target stocking ranges decrease over time to account for natural attrition. Overstorey stocking target ranges at the 9 month monitoring are based on the minimum stocking required to achieve 250 stems/ha with a sufficient bole length for timber production as the rehabilitation ages.