Management Plan

Rehabilitation

Risk Statement: High

This document will be reviewed on a yearly basis, unless a process change occurs earlier than this period. The information in this document relates to management, monitoring and associated reporting required by Development Consent 11_0060 and Mining Leases 1247, 1367 and 1641.

Revision Summary

First Issue	Issue Date	Implementation Requirements	Approved By
0	Feb 03	L O Larsen	

Version No.	Revision Date	Clause No.	Revision Details	Approved By
1	Sept 03		C L Silveira (Update to include NMT feedback)	
2	Sept 04		L S Elliott (annual review, minor grammatical changes)	
3	Oct 05		A J Ryan (annual review, minor grammatical changes, change Manager titles)	
4	Sept 06		R C Morphett (minor changes only)	
5	Nov 07		Reviewed by Environment Team – changes made to comply with Project Approval 06-0026.	NMT 20.12.07
6	Jan 09		Reviewed by T Hardie - Added risk ranking, updated section 7.0 Reporting and section 10.0 Related Procedures.	
7	Sept 13		Review by E&H Advisor Ali Youssef	
8	May 14		Reviewed and Updated bv Bharath Ramakrishnappa – changes made to comply with Project Approval 11_0060.	
9	Oct 17		Annual review – no changes. Plan will be reviewed following Mine Closure Audit in 2018.	
10	Jun 18		Annual review following IEA	

Approval Position	Automatic Notifications

Hard Copy Locations	Associated Documents to be reviewed

Table of Contents

List of Tables

List of Figures

1. SCOPE

This Management Plan applies to all activities undertaken by Northparkes Mines including mining and exploration activities; processing of copper / gold ore resources; project development; maintenance activities; mine closure; logistics; associated service and support function.

This document encompasses all operational and non-operational areas both on and off the NPM mining leases (ML1247, ML1367 and ML1641). This includes the surrounding farm land and offset sites owned and managed by NPM operations. Progressive rehabilitation conducted onsite is integrated with the surrounding NPM owned land and is managed with a view to enhancing the regional landscape and native habitat values.

It is to be utilised for operations and projects that require the rehabilitation of land once finalised or finished and also encompasses progressive rehabilitation and habitat enhancement. The rehabilitation strategy is consistent with the NPM closure strategy which is described in the closure management plan.

1.1 Background

Rehabilitation at Northparkes Mines (NPM) incorporates the entire landholding and not just the area covered by the mining leases. NPM own and manage approximately 6,370ha of surrounding agricultural land that acts as a buffer zone for the operations.

Progressive rehabilitation conducted onsite is integrated with the surrounding NPM owned land and is managed with a view to enhancing the regional landscape and native habitat values. These areas are primarily identified through the Site Disturbance Permit (SDP) process which is on a project based frequency. In addition six monthly reviews by the environment team in conjunction with the farm manager and relevant mine planning personnel occur to identify additional opportunities for progressive rehabilitation.

In addition to these areas, large areas of remnant forest within the agricultural land, particularly along Bogan River, Goonumbla Creek and the ridgelines on the "Rosedale" and "Rocklands" properties, are enhanced to increase biodiversity and landscape function.

Rehabilitation activities are designed for

- Safe
- Stable
- Non eroding

All activities align with the NPM Closure Management Plan. Large scale rehabilitation typically occurs on constructed landforms such as waste rock dumps, tailings storage facilities, topsoil stockpiles and other disturbed areas.

2. OBJECTIVES

The objectives of the Rehabilitation Management Plan (RMP) are:

Feature	Objective
Mine site (as a whole)	• safe, stable and non-polluting • constructed landforms drain to the natural environment (excluding final voids and subsidence areas) • minimise visual impact of final landforms as far as is reasonable and feasible
Agricultural Areas	Land is returned to a condition that sustains agricultural land use to at least the original rural land capability and agricultural productivity and requires a level of management that is comparable to adjacent agricultural areas
Final Voids and Subsidence Zones	• minimise the size and depth of the final voids and subsidence zones so far as is reasonable and feasible • minimise the drainage catchment of the final voids and subsidence zones so far as is reasonable and feasible • negligible high wall instability risk • restrict access • re-vegetate areas surrounding final voids and subsidence zones to minimise erosion • minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood level
Tailings Storage Facilities	• any seepage from TSFs to be contained and treated on the site • filled and shaped to final landform levels • final landforms to be capped and re-vegetated to be stable, self-sustaining, free draining and consistent with surrounding rehabilitated areas
Waste Rock Dumps	Any seepage from waste rock dumps to be contained and treated on the site
Surface infrastructure	To be decommissioned and removed, unless the Executive Director, Mineral Resources agrees otherwise
Native Vegetation	Re-vegetation is to be sustainable for the long term, contains native vegetation communities, second generation trees and habitat for native fauna species
Community	• ensure public safety • minimise adverse socio-economic effects associated with mine closure

These objectives will vary depending on the site and in regard to the agreed final land use. For this reason it is essential that rehabilitation objectives be agreed upon with all relevant stakeholders to establish realistic goals. Progress on these goals will be monitored and reported to relevant internal and external stakeholders.

2.1 Regulatory Requirements

The Rehabilitation Management Plan (RMP) addresses the relevant components of conditions 39 – 41 of the NSW Project Approval (PA11_0060) for the Northparkes Mines Step Change Project. These conditions are outlines in below.

Table 1: NSW Development Consent Conditions – Schedule 3

Condition	Related Section in NMP
Rehabilitation Objectives	
1. The proponent shall rehabilitate the site to the satisfaction of NSW Trade & Investment. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (and depicted conceptually in the figures in Appendix 9), and comply with the objectives in Table below.	Section

Table 2: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	• safe, stable and non-polluting • constructed landforms drain to the natural environment (excluding final voids and subsidence areas)

	• minimise visual impact of final landforms as far as is reasonable and feasible	
Agricultural Areas	• land is returned to a condition that sustains agricultural land use to at least the original rural land capability and agricultural productivity and requires a level of management that is comparable to adjacent agricultural areas	
Final Voids and Subsidence Zones	• minimise the size and depth of the final voids and subsidence zones so far as is reasonable and feasible • minimise the drainage catchment of the final voids and subsidence zones so far as is reasonable and feasible • negligible high wall instability risk • restrict access • re-vegetate areas surrounding final voids and subsidence zones to minimise erosion • minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood level	
Tailings Storage Facilities	• any seepage from tailings storage facilities to be contained and treated on the site • filled and shaped to final landform levels as provided in Appendix 9 • final landforms to be capped and re-vegetated to be stable, self sustaining, free draining and consistent with surrounding rehabilitated areas	
Waste Rock Dumps	• any seepage from waste rock dumps to be contained and treated on the site	
Surface infrastructure	• to be decommissioned and removed, unless the Executive Director, Mineral Resources agrees otherwise	
Native Vegetation	• re-vegetation is to be sustainable for the long term, contains native vegetation communities, second generation trees and habitat for native fauna species	
Community	• ensure public safety • minimise adverse socio-economic effects associated with mine closure	

Progressive Rehabilitation	
2. The Proponent shall rehabilitate the site progressively as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies shall be employed when areas prone to dust generation cannot be permanently rehabilitated. **Note**: It is accepted that some parts of the site that are progressively rehabilitated may be subject to further disturbance at some later stage of the project.	Section 5.4.1
Rehabilitation Management Plan	
3. The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of NSW Trade & Investment. This plan must: a) be prepared in consultation with Planning & Infrastructure, DPI Water, OEH, Council and the CCC b) be submitted to NSW Trade & Investment for approval by 30 June 2014, unless the Secretary agrees otherwise c) be prepared in accordance with any relevant NSW Trade & Investment guideline d) describe how the rehabilitation of the site would be integrated with the implementation the biodiversity offset strategies e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site against the rehabilitation objectives in Table 8, and triggering remedial action (if necessary) f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, and address all aspects of rehabilitation including mine closure, final landform, and final land use g) include interim rehabilitation where necessary to minimise the area exposed for dust generation h) include a program to monitor, independently audit and report on the effectiveness of the measures, and progress against the detailed performance and completion criteria i) build to the maximum extent practicable on the other management plans required under this approval	Section 6 & Section 7

3. RESPONSIBILITY

Specific accountabilities in relation to management of 'rehabilitation' at NPM are outlined in Table 1. Personnel carrying out work under this Management Plan must be familiar with and comply with it in full.

General role responsibilities under this Procedure are outlined in 'HSE Accountabilities' Procedure (DOC ID 3-3563). Personnel carrying out work under this Management Plan must be familiar with and comply with it in full.

Table 3: NPM responsibilities for Rehabilitation Management

Role	Responsibility
All Personnel	Everyone is responsible for identifying hazards with this Management Plan and initiating management of change to correct those deficiencies. Be familiar with and comply with this Management Plan
Manager Director	Review this Management Plan (for effectiveness and its performance against its objective/s). Ensure that the system and this Management Plan are consistent with CMOC Standards, the site HSEQMS and meets the requirements of relevant legal obligations.
PSE Manager	Integrate rehabilitation with surrounding landholding to enhance the regional landscape and native habitat values. Maintain buffer zone around the mine lease to minimise visual impact. Revegetate, monitor and maintain the LNF offset area prior to hand over to DII – Forests. Revegetate, monitor and maintain Estcourt and Kokoda Biodiversity offset site. Undertake Aboriginal Community consultation as necessary. Review and update landscape and rehabilitation completion criteria in line with mine closure planning process. Ensure any incidents which trigger reporting legislation are reported immediately.

Role	Responsibility
Farm Manager	Implement bushfire prevention and control measures in accordance with Table 1. Undertake pest and weed control across the mine lease.
Departmental Managers	Ensure relevant personnel and contractors within their responsibility are aware of and comply with this Management Plan. Monitor the implementation and use of this standard in their department and implement corrective action for any deviations found.
Environment Superintendent	Report against performance criteria in the Annual Review (AR). Report complaints and outcomes of investigations in the AR. Manage activities on site in accordance with this management plan.
Environment Team	Review this Management Plan (for effectiveness and its performance against its objective/s). Ensure identified areas for rehabilitation are progressed in a timely manner and in accordance with this management plan Ensure rehabilitation is undertaken in accordance with the management measures as described in Table 3 Maintain existing remnant vegetation and link through wildlife corridors, wherever possible. Monitor and review progress against operational rehabilitation success indicators listed in Table 4. Apply corrective measures as necessary. Review rehabilitation monitoring results and apply control measures as necessary. Display summary of monitoring results on website and make available at the mine. Maintain and co-ordinate reporting for the monitoring program.

4. KEY ISSUES

4.1 Potential Impacts

The risks and potential impacts associated with this RMP are detailed in but not limited to the aspects contained in Table 4. Risks and potential impacts will directly affect the success towards the completion criteria contained in Table 7 and Table 8 of this RMP, in addition to the health and safety of the community and surrounding environment.

Table 4: Potential Impacts

Risk/Impact	Description
Biodiversity Loss	Reduction in biodiversity value of rehabilitated area due to inability to replace lost habitat and communities.
Erosion	Erosion due to failure of rehabilitation causes risks to human safety, potential runoff and contamination of water courses.
Contamination	Rehabilitation fails due to inability to adequately consider risks of mineral waste resulting in contamination release.
Landform Stability	Stability of landforms on site is reduced due to inadequate rehabilitation and ground cover, posing risks to community and surrounding environment.
Species Richness	Poor planning and incorrect species selection results in dominance of unwanted plant species.
Compliance	Failure to meet legislated rehabilitation goals of site due to a failure of one or more of the measurement measures in Table 5.
Visual Amenity	Failure to consider surrounding landscape and community expectations in landform design results in detrimental impact on visual amenity.
Dust Generation	Failure to establish adequate ground cover through rehabilitating prioritised areas results in excess dust generation and topsoil loss.
Soil Fertility	Failure to rehabilitate areas limiting the stability, infiltration and nutrient cycling capacity of the soil directly affecting physical and chemical fertility.
Fragmentation	Habitat fragmentation occurs resulting in loss of species diversity and richness, accelerating edge effects.

Contamination	Failure to properly rehabilitate exposed areas of waste rock/soil result in Acid Rock Drainage (ARD) generation and heavy metal mobility affecting ground/surface water and soil.

5. MANAGEMENT

The short, medium and long term management measures to be implemented to rehabilitate the site are described below in Table 5

Table 5: Rehabilitation Management Measures

Aspect	Measures	Responsibility	Frequency
Site Disturbance	Prior to the disturbance of any areas, a site disturbance form must be completed and approved by the Environment Section in accordance with the Site Disturbance SOP (DOC ID 3-9174). The form identifies any potential environmental issues associated with the disturbance and control measures to be undertaken. The boundaries of the disturbance areas will be clearly identified to minimise the extent of clearing. No clearing will occur outside these boundaries without additional consultation with the Environment Section.	All personnel.	As required.
Revegetation	To be designed for erosion control, aesthetic improvement and ecosystem regeneration. This is to be undertaken on all constructed landforms and revegetation activities. Depending on the proposed land use, this will involve direct seeding or planting of selected shrub, grass and tree species. Sowing and planting is dependent on seasonal factors and will be scheduled, where possible, in autumn or early winter.	Project owner and Environment Team.	As required.
Seed Collection	Coordinated through local suppliers. Species for revegetation will be native and endemic to the area, where possible. Information can be derived from DECC. (2006). Reconstructed and Extant Distribution of Native Vegetation in the Central West Catchment.; and Sydes, M., Butterfield, L. and Rutledge, S. (2006). A Practical Guide to Revegetation in the Mid Lachlan Region.	Environment Team.	As required.
Planting	Establishment of grass species onsite is undertaken either by: Hydroseeding and mulching; Tractor and cultivator; or Aerial seeding. In establishing revegetation corridors (~50m wide), tube stock is hand planted in rip lines at approximately 4-6m spacing.	Project owner and Environment Team.	As required.
Pre-Clearance Surveys	Where required, a pre-clearing survey would be undertaken by a relevantly trained person to target particular Threatened species known or potentially occurring in the area and identify any critical habitat within the clearing areas for these species. Determination of need for survey will be made by the Environment Dept. Impact management will be undertaken in accordance with: Flora and Fauna Management Plan (DOCID-3-6924) Site Disturbance SOP (DOCID-3-9174)	Project owner and Environment Team.	As required.
Progressive Rehabilitation	Progressive rehabilitation conducted onsite is integrated with the surrounding NPM owned land and is managed with a view to enhancing the regional landscape and native habitat values. These areas are primarily identified through: • Site Disturbance Permit (SDP) process which is on a project based frequency.	Farms Manager, mine planning personnel and Environment Team.	Annually

Aspect	Measures	Responsibility	Frequency
	• Annual reviews by the environment team in conjunction with the farm manager and relevant mine planning personnel.		
Flora and Fauna	Where practical, clearing within woodland communities would be timed to avoid more sensitive breeding, torpor and dispersal periods of the year. Where it is not practical to clear during these times, the pre-clearance survey would minimise the potential impact on these species. All management strategies implemented to minimise impacts on fauna will be undertaken in accordance with the Flora and Fauna Management Plan (DOCID-3-6924).	Project owner and Environment Team.	As required.
Salvaging and Reuse of Material for Habitat Enhancement	Vegetation that is cleared may be placed on rehabilitated areas for habitat enhancement. Cleared native vegetation will be removed whole and placed on progressively rehabilitated areas or within the revegetation areas. This will assist to reduce erosion, disperse seed and provide fauna habitat. Where practical, removed hollow-bearing trees will be re-sited in a suitable location within the Mining lease	Project owner and Environment Team.	As required.
Soil management	Topsoil and subsoil is stripped and stockpiled for later use in rehabilitation in accordance with the Topsoil Management Plan (DOCID-3-3729). Topsoil stockpiles are seeded, marked with signage and surveyed. Topsoil is spread on the shaped area to a minimum depth of 100mm and ripped to allow maximum water infiltration and seed germination.	Project owner and Environment Team.	As required.
Remnant Vegetation and Habitat	Ongoing revegetation plans aim to provide appropriate linkages between areas of adjoining vegetation and wildlife corridors to enhance ecosystem function. Wildlife corridors are established or improved along fence lines, road verges, creeks and drainage lines.	Farms Manager and Environment Team.	As required.
Visual Impact	A buffer zone is maintained around the mine site to minimise impact of the operations on surrounding residences. This buffer zone is managed as a mixture of agricultural land and revegetation areas. Mitigation measures to minimise visual intrusion of the operations include: • maintenance of existing vegetation where possible for visual screening, including infill planting where necessary • establishment of revegetation corridors outside the active mine area • ensuring that areas of disturbance are kept to a minimum at any one point in time • progressive rehabilitation on disturbed areas is undertaken as soon as practical • direction of lighting onsite to minimise impacts to neighbouring properties and road users	Farms Manager and Environment Team.	As required.
Pest and Weed Control	Control of feral animals is undertaken on an as needs basis and is achieved by trapping or baiting. Feral animal control is conducted in consultation with the Local Land Service (LLS). Weed control is undertaken to limit the spread and colonisation of noxious and environmental weeds. Weed control methods include: • ongoing surveillance and reporting • management of topsoil stockpiles to limit weed proliferation and spread • strategic crop rotation, fallow, slashing and controlled burning (where necessary) on agricultural lands • limiting vehicle access to rehabilitated areas • chemical spraying with approved herbicides	Farms Manager and Environment Team.	As required.

Aspect	Measures	Responsibility	Frequency
	• physical removal by manual chipping		
Bushfire Management	Bushfire prevention and control measures implemented include: • firefighting training and awareness provided to relevant personnel, including an onsite Emergency Response Team • provision and maintenance of onsite firefighting equipment • permits for hot work are issued before commencement of works in accordance with the Hot Work Permit SOP (DOCID-3-4079) • appropriate management of hazardous materials • maintenance of designated firebreaks by a combination of grading and spraying • consultation with the NSW Fire Brigade and Rural Fire Service, as required In the event that bushfire management requires the clearance of vegetation the Site Disturbance SOP (DOCID-3-9174) will be implemented.	Emergency Response Team and Environment Team.	As required.
Aboriginal Heritage	A consultative process has been established to discuss rehabilitation activities that pertain to matters of Aboriginal heritage management and address any issues raised. Further detail on consultation with local aboriginal groups is provided in the Cultural Heritage Management Plan (DOCID 3-3993)	Communities and External Relations Team and Environment Team.	As required.
Sustainable Agricultural	Cropping is undertaken within large paddocks, divided by tree lines acting as connected wildlife corridors. All stock has been removed from the area to reduce erosion, compaction and improve regeneration of tree lines. The farming practices implemented include; soil conservation works, conservation tillage practices, stubble retention and an absence of livestock grazing, has contributed to the absence of visible land degradation through erosion and has improved soil quality. Additionally, large areas of remnant forest areas within the agricultural land, particularly along Bogan River, Goonumbla Creek and the ridgelines on the "Rosedale" and "Rocklands" properties, are enhanced to increase biodiversity and landscape function.	Farms Manager and Environment Team.	As required.
Native Habitat Enhancement	NPM has, wherever possible, been able to maintain large sections of remnant vegetation within its landholding. An important component of the rehabilitation strategy is the development and implementation of re-vegetation plans that link the significant areas of remnant vegetation with wildlife corridors and enhance ecological value. The linking of remnant vegetation aims to produce sustainable native ecosystems within the agricultural landscape thereby assisting to conserve biodiversity and maintain evolutionary potential.	Farms Manager and Environment Team.	Annually.

6. PERFORMANCE CRITERIA

Rehabilitation programmes are intrinsically linked to the mine closure planning process in which post-mining landforms and land uses are identified. Accordingly, rehabilitation completion criteria need to assess whether planned post-mining landforms and land uses have been achieved. Presently, NPM envisages a post-mining landscape that comprises a mixture of landforms and land uses, including:

- Voids that will primarily be managed to minimise safety exposures;
- Land capable of supporting agricultural cropping production;
- Land capable of supporting agricultural broad acre grazing; and
- Native vegetation conservation and management.

Rehabilitation completion criteria set benchmarks for a suite of parameters that need to be met to demonstrate that rehabilitation has been successful, or is considered sustainable.
NPM is committed to meeting legislative requirements and industry policies for the decommissioning of sites and closure practices.

Rehabilitation completion criteria identified in Table 7 and Table 8 have been established to define repeatable and consistent methodologies for monitoring changes in various aspects of ecosystem function, succession and long term sustainability. Part of this process included:

- Establishing a range of relevant reference sites to compare and track the progress and inherent ecosystem function of rehabilitation areas;
- Selecting a range of suitable reference sites that reflect the desired final land use, biodiversity targets, historical disturbances and local community expectations; and
- Undertaking a monitoring program that provides simple but informative and reliable information that indicates positive recovery trends or rapid detection of rehabilitation failure.

The criteria in Table 7 and Table 8 have been developed using in field testing and look to incorporate biodiversity values of relevant reference sites. These criteria have not been agreed on and signed as the final proposed completion criteria with all relevant stakeholders, therefore should be considered preliminary and subject to review under routine adaptive management practices.
A framework for landscape and rehabilitation completion criteria in a range of environmental themes has been proposed in Table 6.

Table 6: Proposed framework for landscape and rehabilitation completion criteria

Environmental Theme	Criteria	Timeframe
Land use Planning	Final land use agreed across the mine footprint with key stakeholders	Medium – Long Term (5 years to mine closure)
	Land use plan identifies suitable areas for cropping, broad acre grazing and native vegetation protection and establishment	Medium – Long Term
Maintenance of Existing Environmental Assets	Management plans implemented and reviewed for management of environmental assets	Ongoing
	Clearing of native vegetation minimised	Ongoing
	Appropriate flora and fauna surveys completed before any clearing occurs	Ongoing
	Existing remnant vegetation monitored for extent and condition	Ongoing
	Key flora and fauna species monitored in areas of remnant vegetation	Ongoing
	Introduced plant and animal populations appropriately managed	Ongoing
Rehabilitation Planning	Landscape rehabilitation plan agreed amongst project stakeholders	Medium – Long Term
	Ongoing rehabilitation activities monitored to improve local practices	Ongoing

Environmental Theme	Criteria	Timeframe
Landform Design & Stability	Landforms designed to minimise impact on visual amenity and blend with surrounding landscape	Ongoing – Long Term
	All possible infrastructure removed from the landscape post-mining	Long Term
	Batter slopes stable	Ongoing
	Erosion minimised	Ongoing
	Subsidence and pit slopes are stable	Ongoing and post Mine Closure
Final Void Management	An appropriate Final Void Management Plan agreed with key stakeholders	Medium – Long Term
Generic Vegetation Establishment	An adequate growth medium profile is developed	Ongoing – Long Term
	A perennial vegetation groundcover is established	Ongoing – Long Term
Cropping Land Establishment	Cropping land yield returns are similar to nearby properties	Medium – Long Term
	Cropping returns are sustainable	Long Term
Broad acre Grazing Land Establishment	Broad acre pasture return have similar yields to nearby properties	Long Term
	Grazing returns are sustainable	Long Term
	Weed and feral animal populations appropriately managed	Ongoing – Long Term
Native Vegetation Establishment	Rehabilitation inputs monitored and reported	Ongoing – Long Term
	A realistic goal community defined for each site with consideration of biophysical constraints and opportunities	Medium – Long Term
	Canopy cover, stem density and other structural attributes established at appropriate levels similar to local reference communities or benchmarks	Medium – Long Term
	Weed and feral animal populations appropriately managed	Ongoing – Long Term
	An appropriate species mix used in re-vegetation programs to establish desired communities	Ongoing – Long Term
	An appropriate species composition established compared to reference communities	Long Term
	Fauna has re-colonised vegetation such that habitat use is similar to reference communities	Long Term
	Rehabilitated site resilient to natural disturbance (e.g. fire)	Long Term

Table 7: Success criteria and indicators to monitor grassland rehabilitation

Hierarchy of ecosystem succession	Aspect or ecosystem component	Completion criteria	Performance Indicators	Completion Performance Indicators Description
Performance indicators are quantified by the range of values obtained from replicated reference sites				
Landform establishment and stability	Landform function	Landform is functional and performing as it was designed to do	LFA Stability	Based on key physical, biological and chemical characteristics the LFA stability index provides an indication of the sites stability and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Infiltration	Based on key physical, biological and chemical characteristics the LFA infiltration index provides an indication of the sites infiltration capacity and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Nutrient recycling	Based on key physical, biological and chemical characteristics the LFA nutrient recycling index provides an indication of the sites ability to recycle nutrient and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Landscape organisation	The Landscape Organisation Index provides a measure of the ability of the site to retain resources and that it is comparable to that of the local remnant vegetation
	Active erosion	Areas of active erosion are limited	No. Rills/Gullies	Provides an assessment of the number of gullies or rills occurring in a 50m transect and that these are limited and stabilising
Growth medium development	Soil chemical, physical properties and amelioration	Soil properties are suitable for the establishment and maintenance of selected vegetation species	pH	pH is typical of that of the surrounding landscape or falls within desirable ranges provided by the agricultural industry
			Organic Matter	Organic Carbon levels are typical of that of the surrounding landscape, increasing or fall within desirable ranges provided by the agricultural industry
			Nitrate	Nitrate levels are typical of that of the surrounding landscape or fall within desirable ranges provided by the agricultural industry
Ecosystem & Landuse Establishment	Vegetation diversity	Vegetation contains a diversity of species comparable to that of the local remnant vegetation	Exotic species richness	The total number of live exotic plant species provides an indication of the exotic plant diversity of the site and that it is less than or comparable to the local remnant vegetation
	Ecosystem composition	The vegetation is comprised by a range of growth forms comparable to that of the local remnant vegetation	Herbs	The number of herbs or forb species comprising the vegetation community is comparable to that of the local remnant vegetation
			Grasses	The number of grass species comprising the vegetation community is comparable to that of the local remnant vegetation

Hierarchy of ecosystem succession	Aspect or ecosystem component	Completion criteria	Performance Indicators	Completion Performance Indicators Description
Ecosystem & Landuse Development	Protective ground cover	Ground layer contains protective ground cover and habitat structure comparable with the local remnant vegetation	Perennial plant cover (< 0.5m)	Percent ground cover provided by live perennial vegetation (< 0.5m in height) is comparable to that of the local remnant vegetation
			Total Ground Cover	Total groundcover is the sum of protective ground cover components (as described above) and that it is comparable to that of the local remnant vegetation
	Native ground cover abundance	Native ground cover abundance is comparable to that of the local remnant vegetation	Percent ground cover provided by native vegetation <0.5m tall	The percent ground cover abundance of native species (<0.5m height) compared to exotic species is comparable to that of the local remnant vegetation
	Ecosystem structure	The vegetation is developing in structure and complexity comparable to that of the local remnant vegetation	Foliage cover 0.5 - 2 m	Projected foliage cover provided by perennial plants in the 0.5 - 2m vertical height stratum indicates the community structure is comparable to that of the local remnant vegetation

Table 8: Success criteria and indicators to monitor woodland rehabilitation

Hierarchy of ecosystem succession	Aspect or ecosystem component	Completion criteria	Performance Indicators	Completion Performance Indicators Description
Performance indicators are quantified by the range of values obtained from replicated reference sites				
Landform establishment and stability	Landform function	Landform is functional and performing as it was designed to do	LFA Stability	Based on key physical, biological and chemical characteristics the LFA stability index provides an indication of the sites stability and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Infiltration	Based on key physical, biological and chemical characteristics the LFA infiltration index provides an indication of the sites infiltration capacity and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Nutrient recycling	Based on key physical, biological and chemical characteristics the LFA nutrient recycling index provides an indication of the sites ability to recycle nutrient and that it is comparable to or trending towards that of the local remnant vegetation
			LFA Landscape organisation	The Landscape Organisation Index provides a measure of the ability of the site to retain resources and that it is comparable to that of the local remnant vegetation
	Active erosion	Areas of active erosion are limited	No. Rills/Gullies	Provides an assessment of the number of gullies or rills occurring in a 50m transect and that these are limited and stabilising

Hierarchy of ecosystem succession	Aspect or ecosystem component	Completion criteria	Performance Indicators	Completion Performance Indicators Description
Growth medium development	Soil chemical, physical properties and amelioration	Soil properties are suitable for the establishment and maintenance of selected vegetation species	pH	pH is typical of that of the surrounding landscape or falls within desirable ranges provided by the agricultural industry
			Organic Matter	Organic Carbon levels are typical of that of the surrounding landscape, increasing or fall within desirable ranges provided by the agricultural industry
			Nitrate	Nitrate levels are typical of that of the surrounding landscape or fall within desirable ranges provided by the agricultural industry
Ecosystem & Landuse Establishment	Vegetation diversity	Vegetation contains a diversity of species comparable to that of the local remnant vegetation	Diversity of shrubs and juvenile trees	The diversity of shrubs and juvenile trees with a stem diameter < 5cm is comparable to that of the local remnant vegetation.
				The percentage of shrubs and juvenile trees with a stem diameter < 5cm dbh which are local endemic species and these percentages are comparable to the local remnant vegetation
			Exotic species richness	The total number of live exotic plant species provides an indication of the exotic plant diversity of the site and that it is less than or comparable to the local remnant vegetation
	Vegetation density	Vegetation contains a density of species comparable to that of the local remnant vegetation	Density of shrubs and juvenile trees	The density of shrubs or juvenile trees with a stem diameter < 5cm is comparable to that of the local remnant vegetation
	Ecosystem composition	The vegetation is comprised by a range of growth forms comparable to that of the local remnant vegetation	Trees	The number of tree species regardless of age comprising the vegetation community is comparable to that of the local remnant vegetation
			Shrubs	The number of shrub species regardless of age comprising the vegetation community is comparable to that of the local remnant vegetation
			Herbs	The number of herbs or forb species comprising the vegetation community is comparable to that of the local remnant vegetation
Ecosystem & Landuse Development	Protective ground cover	Ground layer contains protective ground cover and habitat structure comparable with the local remnant vegetation	Perennial plant cover (< 0.5m)	Percent ground cover provided by live perennial vegetation (< 0.5m in height) is comparable to that of the local remnant vegetation
			Total Ground Cover	Total groundcover is the sum of protective ground cover components (as described above) and that it is comparable to that of the local remnant vegetation
	Native ground cover abundance	Native ground cover abundance is comparable to that of the local remnant vegetation	Percent ground cover provided by native vegetation <0.5m tall	The percent ground cover abundance of native species (<0.5m height) compared to exotic species is comparable to that of the local remnant vegetation

Hierarchy of ecosystem succession	Aspect or ecosystem component	Completion criteria	Performance Indicators	Completion Performance Indicators Description
Ecosystem & Landuse Development	Ecosystem growth and natural recruitment	The vegetation is maturing and/or natural recruitment is occurring at rates similar to those of the local remnant vegetation	shrubs and juvenile trees 0 - 0.5m in height	The number of shrubs or juvenile trees < 0.5m in height provides an indication of establishment success and/or natural ecosystem recruitment and that it is comparable to that of the local remnant vegetation
			shrubs and juvenile trees 1.5 - 2m in height	The number of shrubs or juvenile trees < 1.5-2m in height provides an indication of establishment success, growth and/or natural ecosystem recruitment and that it is comparable to that of the local remnant vegetation
	Ecosystem structure	The vegetation is developing in structure and complexity comparable to that of the local remnant vegetation	Foliage cover 0.5 - 2 m	Projected foliage cover provided by perennial plants in the 0.5 - 2m vertical height stratum indicates the community structure is comparable to that of the local remnant vegetation
			Foliage cover >6m	Projected foliage cover provided by perennial plants > 6m vertical height stratum indicates the community structure is comparable to that of the local remnant vegetation
	Tree diversity	Vegetation contains a diversity of maturing tree and shrubs species comparable to that of the local remnant vegetation	Tree diversity	The percentage of maturing trees and shrubs with a stem diameter > 5cm dbh which are local endemic species and these percentages are comparable to the local remnant vegetation
	Ecosystem health	The vegetation is in a condition comparable to that of the local remnant vegetation.	Live trees	The percentage of the tree population which are live individuals and that the percentage is comparable to the local remnant vegetation
			Healthy trees	The percentage of the tree population which are in healthy condition and that the percentage is comparable to the local remnant vegetation
			Flowers/fruit: Trees	The percentage of the tree population with reproductive structures such as buds, flowers or fruit provides evidence that the ecosystem is maturing, capable of recruitment and can provide habitat resources comparable to that of the local remnant vegetation

7. MONITORING

Land rehabilitation performance is monitored on an annual basis to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures.

The criteria this monitoring is conducted against are outlined in Table 7 and Table 8.

The monitoring program has been established to define repeatable and consistent methodologies for monitoring changes in various aspects of ecosystem function, succession and long term sustainability.

Rehabilitation monitoring will occur in existing remnant vegetation, agricultural land and temporary rehabilitated areas. The monitoring of these sites (Figure 1 and Figure 2) will be conducted on an annual basis against the criteria in Table 7 and Table 8.

Table 9 identifies the reference sites and rehabilitation sites that form the current annual monitoring program.

Table 9: Rehabilitation Monitoring

Location	Parameters	Frequency
RWood01	Woodland Criteria (Table 8)	Annually
RWood02	Woodland Criteria (Table 8)	Annually
RWood03	Woodland Criteria (Table 8)	Annually
RWood04	Woodland Criteria (Table 8)	Annually
RGrass01	Grassland Criteria (Table 7)	Annually
RGrass02	Grassland Criteria (Table 7)	Annually
RGrass03	Grassland Criteria (Table 7)	Annually
LFO-01	Woodland Criteria (Table 8)	Annually
LFO-02	Woodland Criteria (Table 8)	Annually
Estcourt 1997	Woodland Criteria (Table 8)	Annually
Beechmore 1999	Woodland Criteria (Table 8)	Annually
Altona 1999	Woodland Criteria (Table 8)	Annually
Kundibah 2001	Woodland Criteria (Table 8)	Annually
TSF1-01	Grassland Criteria (Table 7)	Annually
TSF1-02	Grassland Criteria (Table 7)	Annually
TSF2-01	Grassland Criteria (Table 7)	Annually
TSF2-02	Grassland Criteria (Table 7)	Annually
E22-01	Grassland Criteria (Table 7)	Annually
E22-02	Grassland Criteria (Table 7)	Annually
E26-01	Grassland Criteria (Table 7)	Annually
E27-01	Grassland Criteria (Table 7)	Annually
EOA-01	Woodland Criteria Table 8)	Annually
EOA-02	Woodland Criteria (Table 8)	Annually
EOA-03	Woodland Criteria (Table 8)	Annually
EOA-04	Woodland Criteria (Table 8)	Annually
EOA-05	Woodland Criteria (Table 8)	Annually
EOA-06	Woodland Criteria (Table 8)	Annually

Figure 1: Rehabilitation Monitoring Sites

Figure 2: Rehabilitation Monitoring Location for Estcourt Offset Area

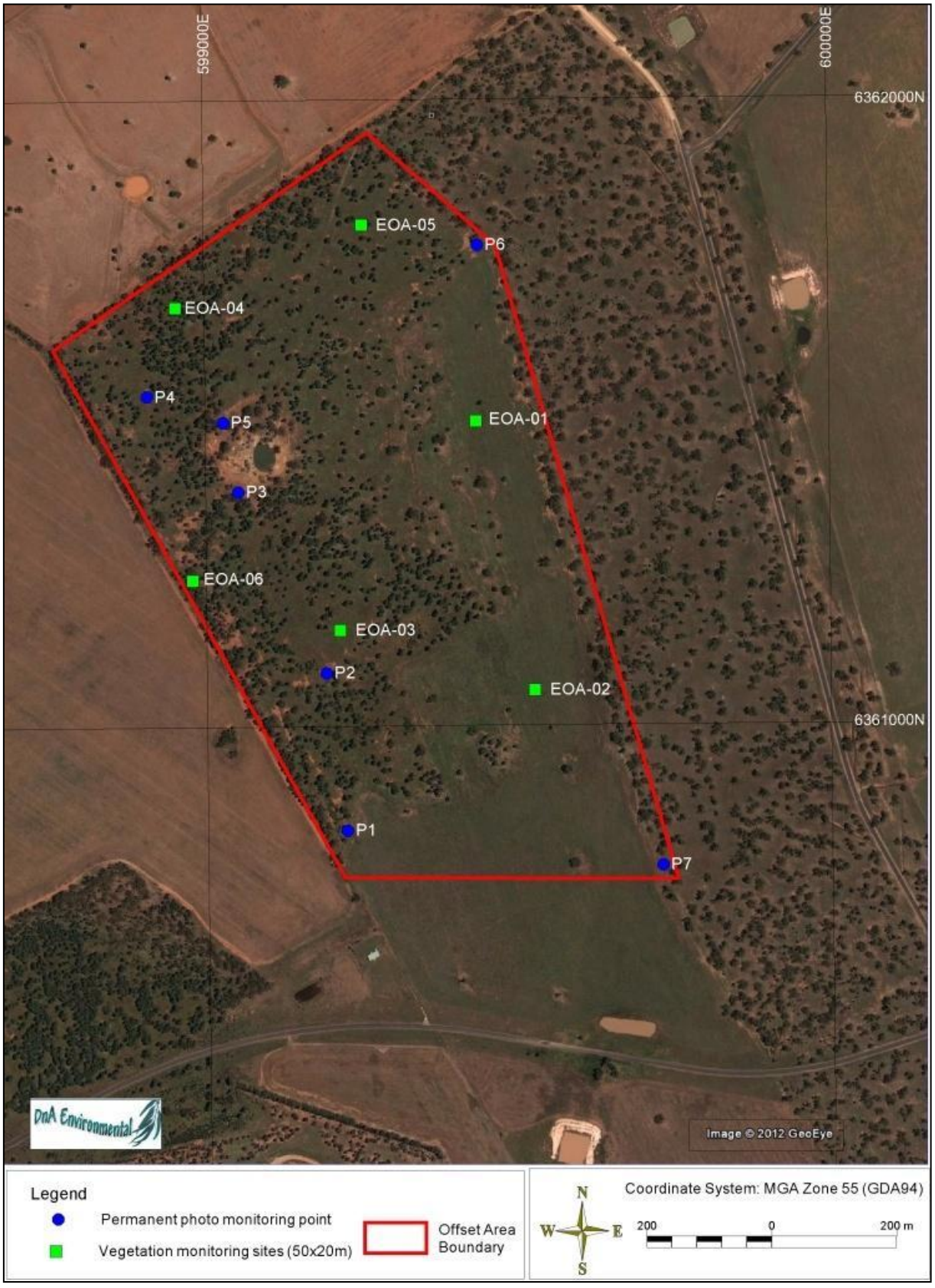

Figure 3: Rehabilitation Monitoring Sites for Estcourt Offset Area

8. REPORTING

NPM will report against the performance criteria outlined in this RMP in the Annual Environmental Monitoring Report (AEMR).

A copy of this RMP will be made publicly available at the mine and on NPM's website in accordance with Condition 11, Schedule 6 of Project Approval (11-0600).Also, a summary of monitoring results will be made publicly available at the mine and on the website, updated on a quarterly basis.

Incident reporting will be in accordance with Condition 7, Schedule 6 of Project Approval (11-0600) and in line with the Injury, Illness and Incident Reporting and Recording Standard (DOCID-3-3898

9. REVIEW / CONTINUOUS IMPROVEMENT

The Rehabilitation Management Plan will be reviewed and updated annually or in the case of a significant operational change. The review will include an assessment of the effectiveness of control measures and performance against the Plan's objectives.

The objectives of a review are:

- to maintain compliance with statutory requirements
- to identify opportunities for improvement in the management plan
- incorporate community considerations

The NMP review will include:

- this Document
- Legislation, Approval, Licence changes
- community complaints and enquiries

Results of monitoring will be reviewed to identify where improvements are required in design works, annual rehabilitation plans or where maintenance is required to existing rehabilitation.

10. RELATED DOCUMENTS

ID No.	Doc ID No.	Doc ID No.
	Vegetation Management Plan	DOCID-3-6923
	Landscape Management Plan	DOCID-3-3730
HSE-PRO-889	Standard Operating Procedure Site Disturbance Permit	DOCID-3-3990
	Ground Disturbance and Rehabilitation SOP	DOCID-3-3728
	Land Use Management Plan	