

TANAMI PROJECT EL26625, EL27806, EL27921, EL27997, EL28493

2017

MINE MANAGEMENT PLAN FOR EXPLORATION OPERATIONS AUTHORISATION No. 0825-01

Tenement Numbers: EL26625, EL27806, EL27921, EL27997, EL28493

Tenure Holder: Tychean Resources Limited

Tenure Operated by: Ramelius Resources Limited

Author: Erik van Noort

Date: 17/10/2016

This Updated Mine Management Plan for the Tanami Project (Authorisation No. **0825-01**) is submitted pursuant to section 41(1) of the MMA and Condition 2 of the Authorisation.

	Author	Reviewed by	Approved by
Date	24/10/2017	24/10/2017	24/10/2017
Name	Erik van Noort	C. Morton	Kevin seymon
Signature	luatet	C. Mata.	ale

I, Erik van Noort (Senior Geologist) declare that to the best of my knowledge the information contained in this mining management plan is true and correct and commit to undertake the works detailed in this plan in accordance with all the relevant Local, Northern Territory and Commonwealth Government legislation.

SIGNATURE: Lun MA

DATE: 24/w/2017

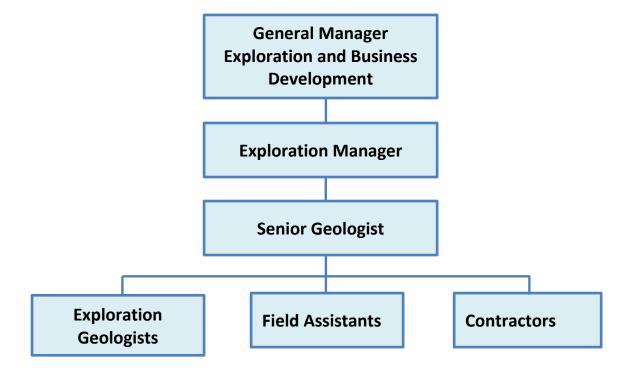
Contents

1. OPERATOR	R DETAILS	4
1.1 Orgai	nisational Structural Chart	4
1.2 Work	force	5
1.3 Socio	-economic aspects	5
2. IDENTIFIE	O STAKEHOLDERS AND CONSULTATION	6
2.1 Lando	owner Consultation	6
	DETAILS	
	ocation and Layout	
	ous Activities and Current Status	
	Historical Exploration	
	Exploration by Ramelius Resources	
•	osed Activities	
	EL26625, EL27921, EL27997 and EL28493	
	EL27806	
	PROJECT SITE CONDITIONS	
	MENTAL MANAGEMENT SYSTEM	
	onmental Policy and Responsibilities	
	tory Requirements	
	statutory Requirements	
	tion and Training	
	ification of Environmental Aspects and Impacts	
	gency Procedures and Incident Reporting Environmental Emergency Procedures	
	Management of Environmental Incidents and Identified Hazards	
	ncident Reporting Procedure	
	onmental Audits, Inspections and Monitoring	
	onmental Performance Reporting	
	Objectives and Targets	
	Performance Reporting	
	ION REHABILITATION	
	ng Of Closure Activities	
ADDENID V 4	Cita Diaga	
APPENDIX 1	Site Plans	
APPENDIX 2	Register of Drilling and Site Disturbance Activities	
APPENDIX 3	Correspondence with Aboriginal Areas Protection Authority	
APPENDIX 4	Ramelius Resources Environmental Procedures for Exploration	
APPENDIX 5	Formal Emergency Procedures and Incident Reporting	
APPENDIX 6	Desktop Surveys of Flora and Fauna Species	
APPENDIX 7	Security Calculation Workbook	

1. OPERATOR DETAILS

Operator Name	Ramelius Resources Ltd
Key Contacts	Kevin Seymour (Gen. Manager Exploration and Business Development) Volker Gartz (Exploration Manager) Erik van Noort (Senior Geologist)
Postal Address	PO Box 6070 East Perth W.A. 6892
Street Address	Level 1, 130 Royal Street East Perth W.A. 6004
Phone	(08) 9202 1127
Fax	(08) 9202 1138
Email	kevinseymour@rameliusresources.com.au volkergartz@rameliusresources.com.au erikvannoort@rameliusresources.com.au

1.1 Organisational Structural Chart



1.2 Workforce

The number of Ramelius Employees would comprise up to 8 people, including General Manager, Exploration Manager, Senior Geologist, Exploration Geologist and field assistants.

Total number of contractors would typically be up to 8 people, and vary according to the exploration stage of specific projects. Contractors include drilling crew, and contract field assistants.

Work Descriptions

Senior Geologist: Reports to Exploration Manager and oversees all exploration activities on

the project, including supervision of company geologists and field assistants. Consultation with all stakeholders, including pastoralists, native title parties and government departments. Preparation of company and departmental reports. Role also includes field-based duties, including

drilling supervision, mapping, and geochemical sampling.

Exploration Geologist: Reports to senior geologist and undertakes exploration activities on the

company's tenements. Duties include drilling supervision and logging,

mapping, geochemical sampling and exploration logistics.

Field Assistants: Report to the Exploration and Senior Geologists. Responsible for

exploration logistics, surface sampling, drill-hole sampling, rehabilitation

procedures.

1.3 Socio-economic aspects

Where possible, the company will aim to use local, NT-based contractors for drilling, earthmoving and rehabilitation needs (e.g. Darwin, Alice Springs).

Whist the project is currently at a preliminary stage, as the project develops the company will assess the possibility of employing members of local indigenous communities for specific contract-based work where possible. This will be done in consultation with the Central Land Council.

2. IDENTIFIED STAKEHOLDERS AND CONSULTATION

Stakeholders associated with the project include:

Lease Owner	Tychean Resources Ltd	
Tenement Manager	Ramelius Resources Ltd	
Landowners	Suplejack Pastoral Lease (PPL1108)	Bill Cook Suplejack Downs Station Ph. (08) 8956-8764
	Central Desert Aboriginal Land Trust (NTP1740)	
Native Title Parties	Central Land Council	Nick Raymond Mining Officer CENTRAL LAND COUNCIL Ph. 08 8951 6263
Government Departments	Department of Primary Industry and Resources Department of Lands Planning and Environment Department of Land Resource Management Aboriginal Areas Protection Authority Power and Water Corporation	

2.1 Landowner Consultation

Central Desert Aboriginal Land Trust – Central Land Council

Tenements EL26625, EL27921, EL27997, and EL28493 are located on land vested in the Central Desert Aboriginal Lands Trust NTP1740, and landowner consultation for this license is done with the Central Land Council (CLC). As part of the application process, the company entered into negotiations with the Central Land Council (CLC), and a Deed for Exploration was finalised with the CLC on 1st February, 2011.

In accordance with the provisions of the Aboriginal Land Rights (Northern Territory) Act, the company initially provided an Exploration and Mining Proposal to the CLC in September 2008, and subsequently an updated proposal in July, 2014.

In accordance with the Deed for Exploration, the company provided the CLC with a Work Proposal (2016 calendar year) and Sacred Site Clearance Application. The work proposal was approved by the CLC in November 2015 under the conditions of Sacred Site Clearance Certificate C2014-133. All amendments to the 2016 work programmes were submitted to the CLC and approved. Any planned exploration for 2018 will likewise be submitted for approval. If warranted, site inspections including cultural heritage surveys and environmental reviews will be conducted prior to exploration activities, in accordance with the Deed for Exploration.

Suplejack Pastoral Lease

The Talbot North Project (EL27806) is located on the Suplejack Pastoral Lease PPL1108. For previous work programmes, consultation with the Landholder has been done in accordance with the Code of Conduct for Mineral Explorers. On-ground exploration on EL27806 is not yet planned for 2018 (office-based technical assessment in progress) and access to the pastoral lease is not required. Should any future on-ground activities be proposed, a land access agreement will be formulated with the landholder and provided to the department, along with the necessary amendments to the Mine Management Plan.

Aboriginal Areas Protection Authority

In addition to the approvals process with the Central Land Council above. information from the records of Registered Sacred Sites is obtained for all Exploration areas from the Aboriginal Areas Protection Authority, prior to commencing any exploration activities.

3. PROJECT DETAILS

3.1 Site Location and Layout

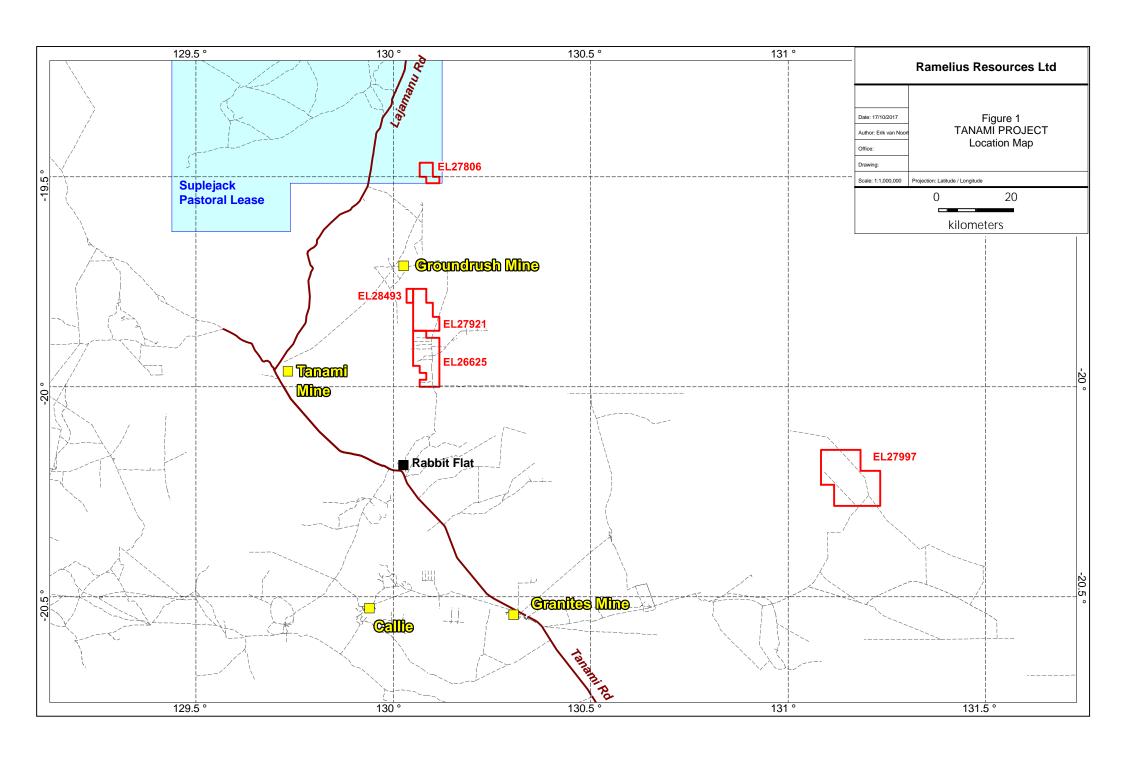
The Tanami Project (Authorisation No. 0825-01) is located approximately 600km NW of Alice Springs and comprises granted ELs 26625, 27806, 27921, 27997, and 28493 (Figure 1). The nearest mining centre is the Granites gold mine, located 70km to the south. The Authorisation initially comprised exploration licences EL26625 and EL27806, and will be amended for 2017 to also include ELs 27921, 27997, and 28493.

The tenements are jointly held by Ramelius Resources Ltd (85% ownership) Tychean Resources Ltd (15% ownership), and since May, 2014 the project has been the subject of a Joint Venture Agreement between the two companies. Ramelius Resources Ltd manage all exploration programmes on the project. Tenement details are summarised in Table 1 and the location of the project is shown in Figure 1. More detailed plans, showing location and layout of the project areas, are included in Appendix 1.

Vehicle access to EL26625, EL27921, and EL28493 from Alice Springs is by way of the Tanami Highway to Rabbit Flat Roadhouse, thence northwards approximately 40km to the tenements. Access to EL27997 is by way of the Tanami Highway to the Granites goldmine, thence eastwards approximately 100km to the tenement. Access to EL27806 is by way of the Tanami Highway to the Lajamanu turn-off, thence northwards approximately 70km to Suplejack Station, thence by station tracks to the tenement.

Table 1: Tanami Project Tenement Details

Tenement	Holder	Operator	Grant_Date	Expiry_Date	Sub_Blocks	Land_Tenure
EL26625	Ramelius Resources Ltd (85%) Tychean Resources Ltd (15%)	Ramelius Resources Ltd	24/05/2011	23/05/2019	26	Central Desert Aboriginal Land Trust
EL27806	Ramelius Resources Ltd (85%) Tychean Resources Ltd (15%)	Ramelius Resources Ltd	14/07/2010	13/07/2018	6	Suplejack Perpetual Pastoral Lease
EL27921	Ramelius Resources Ltd (85%) Tychean Resources Ltd (15%)	Ramelius Resources Ltd	01/06/2017	31/05/2023	18	Central Desert Aboriginal Land Trust
EL27997	Ramelius Resources Ltd (85%) Tychean Resources Ltd (15%)	Ramelius Resources Ltd	01/06/2017	31/05/2023	57	Central Desert Aboriginal Land Trust
EL28493	Ramelius Resources Ltd (85%) Tychean Resources Ltd (15%)	Ramelius Resources Ltd	01/06/2017	31/05/2023	2	Central Desert Aboriginal Land Trust



3.2 Previous Activities and Current Status

3.2.1 Historical Exploration

EL26625

The area covering EL26625 was explored by Zapopan Ltd from 1990 to 1995, as part of historic license EL5411. Work carried out included limited laterite and rock-chip sampling, shallow RAB drilling, and several RC drilling campaigns. The majority of the drilling was considered too shallow to have effectively tested the basement Tanami Group lithologies.

The current operator does not have any records of ground disturbance or rehabilitation associated with the drilling campaigns. Historic drill sites were inspected during 2014-2015. No evidence of ground disturbance was observed at these locations and it is presumed that previous operators have successfully rehabilitated all areas of ground disturbance.

EL27806

The area covering EL27806 was explored by Zapopan Ltd from 1990 to 1995, as part of historic license EL5412. Work carried out included geological mapping, rock-chip sampling, soil sampling and laterite geochemistry. No ground disturbing activities appear to have been conducted as part of this exploration.

From 1997 to 2009, the area was explored by Otter Gold and Newmont Ltd as part of historic EL9602. Work conducted included aeromagnetic interpretations, regolith mapping, soil and lag geochemistry and RAB drilling (10 holes). The current operator does not have any records of ground disturbance or rehabilitation associated with the RAB drilling.

EL27921 and EL28493

The area covering ELs 27921 and 28493 was explored by AngloGold from 2001 to 2005 – exploration included minor auger soil geochemistry and RAB and air-core drilling over selected areas. The current operator does not have any records of ground disturbance or rehabilitation associated with the RAB drilling.

EL27997

The area covering EL27997 was originally held by Zapopan (EL4519) from 1990-1992, who conducted regional gold and base metal exploration, although little work was carried out beyond regional aeromagnetic interpretations. Normandy / North Flinders Mines held the ground as part of their Sore Tooth North Project (EL8287) from 1996 to 1998. Work carried out over the license area included interpretation of aeromagnetic data, regional lag sampling and composite rock-chip sampling over areas of subcrop or outcrop. No drilling has been carried out on the license area, and there are no records of ground disturbance.

3.2.2 Exploration by Ramelius Resources

2014-2016

RC drilling was undertaken on EL26625 by Ramelius Resources **during 2015 and 2016** in accordance with proposals outlined in the 2014 and 2015 Mine Management Plans, and subsequent amendments. In total, 72 holes were drilled for 6579m:

Total	72 holes for 6579m	(SJRC0001-SJRC0072)	
August 2016	18 holes for 1494m	(SJRC0055-SJRC0072)	
September 2015	7 holes for 1356m	(SJRC0048-SJRC0054)	
June-July 2015	32 holes for 2523m	(SJRC0016-SJRC0047)	
March 2015	15 holes for 1206m	(SJRC0001-SJRC0015)	

Drilling on EL26625 encountered variable amounts of groundwater, although no significant flows were encountered. The sumps prepared were more than sufficient to contain the groundwater brought to surface. Water was typically fresh and not saline.

Rehabilitation of all remaining drill pads and tracks was carried out during 2016. In total, 59 pads and 8.1km of tracks were rehabilitated in 2016 (see Table 2).

Field reconnaissance work was undertaken on EL27806, which involved access along existing station tracks and cross-country quad-bike access, with no vegetation clearing or ground disturbance required. An attempt was made to locate historic drill collars (Otter Gold/Newmont) in the northern part of the license. Holes were not located and it is presumed that previous operators have successfully rehabilitated areas of ground disturbance.

A register of drill-hole locations and disturbance areas is presented in Appendix 2.

2016-2017

No new ground disturbing activities were carried out on the project during the past year, although rehabilitation was completed on all of the remaining disturbed areas of EL26625, as summarised on Table 2.

Table 2: Tanami Project – ground disturbing activities for previous period (2016-2017)

Activity	EL26625	EL27806	EL27921	EL27997	EL28493
Number holes	0	0	0	0	0
proposed					
Number of	0	0	0	0	0
holes drilled					
Maximum	NA	NA	NA	NA	NA
depth of holes					
Drill pads	0	0	0	0	0
cleared					
Drill sumps	0	0	0	0	0
Tracks	0 km	0 km	0 km	0 km	0 km
Camp area	0	0	0	0	0
cleared					
Costeans/bulk-	0	0	0	0	0
sample pits					
Total area	1 camp site	0	0	0	0
rehabilitated	(0.5Ha) 35				
	drill pads				
	(1.26 Ha) &				
	16.2km of				
	tracks				

3.3 Proposed Activities

Proposed exploration activities for the Tanami Project are summarised in Table 3.

3.3.1 EL26625, EL27921, EL27997 and EL28493

A program of reconnaissance work will be undertaken. This will comprise geological mapping, soil sampling and possibly airborne geophysics. This work is anticipated to take approximately 10-15 days.

The reconnaissance will be carried out by a team of 2-4 personnel from Ramelius Resources, using 1-2 Landcruiser-sized vehicles and/or quad bikes. Where possible, existing access tracks will be utilised, although some cross-country vehicle access will be required.

No drilling activities are currently planned. Should drilling be required, the MMP and security calculation will be amended to reflect the changes.

A fly camp will be established for field activities – this will typically comprise a number of tents and swags for 2-4 Ramelius staff and will be setup directly adjacent to an existing track. No clearing will be required other than minor hand clearing of spinifex to place tents. A generator and fuel drum will also be required. Water will be either carted in a separate water trailer on in drums. General waste will be contained in lined garbage bins and removed to an appropriate waste disposal facility upon completion of the programme. For short programmes, human waste can be buried. For longer programmes (e.g. longer than a week) a chemical toilet will be provided.

3.3.2 EL27806

The currently proposed work for 2018 is office-based and no on-ground access is required at this stage. Any follow-up exploration will be dependent on the outcome of geophysical targeting and the company is currently not in a position to propose on-ground exploration activities or ground disturbance. Should the modelling exercise define targets that require further on-ground exploration, including drilling, an updated Mine Management Plan and security calculation will be submitted to the department.

Table 3: Summary of proposed exploration activities

Mining Interests (i.e. titles)	EL27806	EL26625, EL27921, EL27997, EL28493
What time of the year will exploration occur?	April-October, 2018	April-October, 2018
How long is exploration expected to occur?	7-10 days	10-15 days
Type of drilling (i.e. RAB, RC, Diamond, aircore)	No drilling or site access proposed	No drilling proposed; Reconnaissance only
Target commodity	Gold	Gold
Is drilling likely to encounter radioactive material?	N/A	N/A
Number of proposed drill holes	0	0
Maximum depth of holes	N/A	N/A
Number of drill pads (Length: 15x Width:20 m)	0	0
Is drilling likely to encounter groundwater? (Y, N, unsure)	N/A	N/A
Number of sumps (Length: 3m x Width: 3m x Depth: 2m)	0	0
Length of line / track clearing (Kilometres: 10 x Width: 4 m)	0	0
Number of costeans (Length: x Width:x Depth: m)	0	0
Total bulk sample (tonnes) (Length: x Width: x Depth:m)	0	0
Will topsoil be removed for rehabilitation purposes?	No	No
Previous disturbance (by Ramelius) yet to be rehabilitated on title (ha) if known	0	0
Camp (Length: 15 x Width: 15m)	0	0
Total area disturbed (hectares)	0	0
Other:		

4. CURRENT PROJECT SITE CONDITIONS

Site Conditions	Description					
Geology	Basement Proterozoic "Tanami Group" geology comprises Dead Bullock Formation (DBF) units as north to NW-trending, moderately magnetic sequence, comprising siltstone, metapelite, and chert, conformably overlain to the east by the Killi Killi Formation, which comprises turbiditic sandstones. The western part of the project area includes intrusive granodiorite of the Palaeoproterozoic Coomarie Suite. Proterozoic Gardiner Sandstone and Cambrian basalt flows unconformably overlie and conceal much of the Tanami Group Basement, and Tertiary colluvial sheetwash and aeolian sands overlie much of the project area. Soil types classified as Tenosols, loams.					
Hydrology	Surface hydrology comprises limited small, first-order ephemeral creeks and sheetflow. Little to no defined drainage channels occur. No bores are located on the tenements. Nearest bores are located near the Lajamanu Road, some 15km to the west. Bore number 12512, located at Jiwaranpa Outstation, 18km SW of the license recorded TDS of 910 to 130, and considered suitable for drinking water and stock watering. Minor groundwater flows were encountered during RC drilling on EL26625. No analyses were carried out but water appears to be reasonably fresh.					
Flora						

	Listed Threatened Species include:					
	Liopholis kintorei	Great Desert Skink	VU			
	Falco hypoleucos	Grey Falcon	VU			
	Varanus panoptes	Yellow-spotted Monitor	VU			
	Rostratula australis	Australian Painted Snipe	EN			
	Dasycercus blythi	Brush-tailed Mulgara	VU			
	Dasycercus cristicauda	Crest-tailed Mulgara	VU			
	Macrotis lagotis	Greater Bilby	VU			
	Notoryctes typhlops	Southern Marsupial Mole	VU			
	Isoodon auratus	Golden Bandicoot	EN			
Fauna	Notoryctes caurinus	Northern Marsupial Mole	EN			
	Zyzomys pedunculatus	Antina	EN			
	Invasive Species include:					
	Bos Taurus (Domestic Cattle)					
	Camelus dromedaries (Camel)					
	Felis catus (Feral Cat)					
	Vulpes vulpes (Red Fox)					
	Wild dogs					
	Oryctolagus cuniculus (Rabbit)					
	Equus asinus (Donkey)					
	Mus musculus (house mouse)					
	EL26625, EL27921, EL27997 and EL28493 – Tenure located within Aboriginal Land vested in the Central Desert Aboriginal Land Trust. Land use is classified as Traditional Indigenous Uses.					
Land Use	Central Desert Aboriginal Land Trust. Land use is classified as Traditional Indigenous Oses.					
	EL27806 – Tenement wholly located within Suplejack Perpetual Pastoral Lease (PPL1108). Land					
	use classified as Grazing natural vegetation.					
		L28493 – No record of sacred sites a				
	tenement area (see attached reference letters from AAPA; Appendix 3). All proposed exploration will be conducted according to the Deed for Exploration with the CLC. Any ground					
Historical,	disturbance will be cleared with the CLC, with specific areas to be inspected in the field if					
Aboriginal,		ce certificate was obtained from the				
Heritage	pertaining to the 2015, 2016 and 20	17 work programmes.)				
Sites						
Jiles						
	EL27806 – No record of sacred sites letter from AAPA; Appendix 3).	are listed within the tenement area (see	e attached reference			

5. ENVIRONMENTAL MANAGEMENT SYSTEM

Ramelius Resources Environmental Procedures are attached to this document as Appendix 4D.

5.1 Environmental Policy and Responsibilities

The company's Health, Safety and Environmental Policy is shown below:



Health Safety and Environment Policy

Ramelius Resources & its subsidiaries are committed to the health and safety of its employees and the protection of the environment in which it operates.

Ramelius conducts its operations to ensure it can:

- Provide a safe workplace for its employees and contractors and any members of the public that may be affected by its operations;
- Comply with applicable legislation and standards relating to Health and Safety in the workplace;
- Limit its impact on the environment by minimising the area it affects whilst conducting its operations and complying with applicable legislation and environmental standards.

Ramelius will achieve these objectives by:

- Developing HSE procedures with its employees and having regular meetings to discuss health and safety;
- Recognising safe work practices by employees and promoting continuous improvement in all aspects of our work;
- Ensuring that HSE incidents, hazards, near misses, or concerns are reported, investigated and steps taken to prevent them occurring again;
- Being aware of, and adopting where appropriate, industry advancements in health, safety and environmental practices;
- Ensuring that all employees are aware of their duty to work safely and to follow reasonable health and safety directions given by their supervisor;
- Limiting as much as possible the area required to conduct our operations and rehabilitating areas used for mining to a high standard.

Application of this policy through visible and accountable leadership resides with the Ramelius Resources Management and with all employees sharing responsibility for its implementation

RAMELIUS RESOURCES LIMITE Registered Office 140 Greenhill Road Unley SA 5061 Tel 08 8373 5588 Fax 08 8373 5917

Level 1, 130 Royal Street
East Perth WA 6004
Tel 08 9202 1127
Fax 08 9202 1138
Email info@rameliusresouro

Mark Zeptner CEO July 2014 Ramelius is committed to the effective environmental management of all its exploration, mining and processing activities. The company believes that responsible environmental management has a positive impact on the company's success and the sustainability of the business.

The Company recognises that mining is a temporary land use, and is associated with a range of potential environmental impacts. Prior to commencement of operations, mine planning must recognise these potential impacts and lead to the development of effective strategies for their control. During operations, the successful implementation of these strategies must be a principal objective of site management. Following decommissioning, the site must be left in a safe and stable state, with all disturbed land successfully rehabilitated to an agreed standard.

To achieve these objectives, each site is required to:

- Comply with all applicable legislation and operating conditions.
- Operate in accordance with a site environmental management plan.
- Identify and manage environmental risk and liability.
- Minimise unnecessary environmental impacts.
- Work towards the achievement of a high level of external recognition for the quality of onsite environmental management.

Company management is committed to providing the resources and support required for the achievement of best practice and the ongoing improvement of environmental management at all Ramelius sites.

Ramelius' philosophy towards environmental management is such that environmental management is the responsibility of all exploration employees and contractors. In accordance with the company's guidelines, the Exploration Manager must ensure that all environmental issues are identified and managed according to the procedures applicable for the site. The on-site Geologist or Senior Field Assistant must ensure the procedures are complied with by the contractors or site personnel undertaking the activities.

5.2 Statutory Requirements

Current applicable legislation under which the Talbot North Project will be operated include:

- Mining Management Act
- Mining Management Regulations
- Mineral Titles Act
- Weeds Management Act
- Bushfires Act
- Aboriginal Land Rights (Northern Territory) Act
- Native Title Act
- Territory Parks and Wildlife Conservation Act
- Water Act
- Plant Health Regulations
- Heritage Act 2011
- NT Aboriginal Sacred Sites Act
- Environment Protection & Biodiversity Conservation Act

- Work Health and Safety (National Uniform Legislation) Act 2011
- Soil Conservation and Land Utilization Act
- Waste Management and Pollution Control Act
- Protocols relating to Plant Health Regulations under the Plant Health Act
- Reporting requirements, which include Statutory Annual Reports on exploration activities and expenditure to the Department of Primary Industry and Resources
- Lease conditions, including expenditure requirements
- Authorisation conditions, including requirements to hold the relevant authorization before carrying out work involving substantial disturbance

5.3 Non-statutory Requirements

Non-statutory requirements applicable to the project include:

- Obtain and review records for Registered Sacred Sites for exploration areas from the Aboriginal Areas Protection Authority
- Code of Conduct for mineral explorers in the Northern Territory
- Deed for Exploration with Central Land Council for EL26625

5.4 Induction and Training

All company employees involved in exploration are required to complete an Exploration Induction at the commencement of employment, which includes all environmental procedures. Employees are also required to be familiar with the company's Environmental Procedures for Exploration, attached to this MMP as Appendix 4D.

All contractors to site are required to complete a Site Induction, that outlines the company's and contractor's environmental responsibilities and procedures. During field operations, weekly exploration safety meetings are held, during which all environmental issues are fully addressed. The main environmental issues that are covered as part of the Exploration Induction are:

- Planning
- Ground disturbance
- Construction of access tracks and gridlines
- Rehabilitation of access tracks and gridlines
- Construction of drill sites and management of drilling programs
- Capping of drill holes
- Rehabilitation of drill sites
- Construction and rehabilitation of costeans
- Construction and management of exploration camps
- Closure and rehabilitation of exploration camps
- Hydrocarbon management
- Waste management
- Exploration in environmentally sensitive areas
- Rehabilitation inventory and auditing
- Fire safety and prevention
- Emergency response procedures
- Identification of Threatened Flora and Fauna and Invasive Species

5.5 Identification of Environmental Aspects and Impacts

Aspect	Impact	Risk Rating	Management Measures (prevention)	Management Measures (remediation)	Residual Risk Rating
Clearing of drill sites, tracks,	Loss of native flora and fauna	12	sensitive areas and heritage sites and in	 Topsoil and vegetation to be stockpiled for use in rehabilitation Rip or scarify disturbed areas, if necessary, taking into consideration the potential for erosion, particularly on sloping sites 	9
camp site	• Soil erosion	12	Access via existing tracks where possibleAvoid clearing of vegetation where possible		9
	• Visual Impacts	9	 Tracks aligned to avoid larger trees and shrubs and their near-surface root zones. Overhanging trees and vegetation should also be avoided Vegetation to be cleared with blade above ground to avoid loss of root stock Avoid creation of windrows at the sides of cleared lines Minimise areas of disturbance to smallest practical area Minimise disturbance to drainage lines – natural drainage lines should not be blocked Extensive ground compaction should be avoided, wherever possible Drill sites should be positioned to create minimal disturbance to landform and vegetation and should be located on flat ground, wherever possible. Construct sumps with a slope to allow fauna egress 	 Return topsoil and any cleared vegetation to the site Sumps to be filled in and rehabilitated 	6

Drilling	Hydrocarbon spills – contamination of soil	12	 Compliance with Australian Standards 1940 for the storage and handling of flammable liquids Availability and use of hydrocarbon spill 	 All sample material to be either removed from site, returned down drill-hole, or buried in sumps 	9
	Dust and noise emission – pollution and disturbance to fauna	6	Containment of leaks and spillages to prevent them from contaminating surrounding soil or entering any watercourse or water drainage system Dust suppression during drilling, using water injection, etc Excessive groundwater encountered in drilling to be directed into drill sumps Clearing of grasses around worksite to minimise fire risk Availability of fire extinguishers and firefighting equipment including backpacks	Plastic bags are not planned for use in the collection of sample material. If any are used, all will disposed of at an approved disposal facility	6
	Drilling sample materials – visual impact and effects on flora	13		 Soils contaminated with hydrocarbons or drill fluids to be removed from site and disposed of at an approved disposal facility Drill holes to be plugged at 0.5m below ground 	10
	• Groundwater — saline groundwater may impact local flora	12		 level (use of octo-plugs to be avoided) Soil backfill over drill-holes should be compacted and mounded over the hole to allow for subsidence and to limit the pooling of surface water Waste oils, drilling fluids and rubbish to be disposed into appropriate containers and disposed of at an approved site. Oils and rubbish not to be disposed in the drill sump. 	9
	•Fire risk	11			7
Fuel Storage	Hydrocarbon spills – contamination of soil, surface and groundwater	8	 Compliance with Australian Standards 1940 for the storage and handling of flammable liquids Fuel storage areas to be appropriately bunded Hydrocarbons stored at site should be at a safe distance (to be designated) from water courses Transport of hydrocarbons must be in accordance with the appropriate licence and regulations All empty fuel and oil drums to be removed from site on completion of the exploration program. 	Any spillages to be cleaned up immediately and any soils contaminated with hydrocarbons should be treated or removed	5

			Waste fuels and oils to be disposed of at an approved disposal site		
Camping on exploration projects	Disturbance to flora and fauna	10	 disturbed ground, if available, or situated where environmental impacts will be minimal Measures should be implemented to avoid potential contamination of surface and groundwater. 	 Remove all facilities and remaining waste material. Remove or remediate any soil contaminated by fuel or chemical spills. 	10
	Ground disturbance, soil erosion	9		 Determine the rehabilitation requirements of each area. Rehabilitate according to the requirements, ripping and respreading topsoil where necessary. 	5
	• Fire risk • Contamination of	11			3
	surface and groundwater				
Driving between	 Spread of weeds/pests 	12	 Wash down vehicles prior to travelling between different project areas 	Rehabilitation of access tracks should be carried out prior to relinquishment of the	8
drill sites / tenements	Soil erosion	9	 Consult with landholders on specific requirements to minimise risk of weed spreading If vehicles are to traverse unprepared terrain more than once the same wheel tracks should be used each time 	exploration licence unless requested otherwise by the landholder	5

Procedures for Identifying Impacts

Procedures in place for identifying impacts comprise an initial review of available environmental parameters, including flora and fauna assessments, groundwater, surface drainage and heritage studies. As part of preliminary field investigations, the exploration area is inspected and a risk assessment is completed.

A risk assessment matrix is used to calculate the risks associated with specific environmental hazards. Calculated risk scores as greater than 20 are ranked as Extreme. The risk assessment matrix and associated definitions in place with the company are outlined below.

Risk Assessment Matrix

Level of risk (number) = Likelihood of Occurrence x Severity of Result

	CONSEQUENCE						
			1	2	3	4	5
LIKELIHOOD			Insignificant	Minor	Moderate	Major	Catastrophic
	5	Almost certain	14	19	22	24	25
	4	Likely	10	13	18	21	23
	3	Possible	6	9	12	17	20
	2	Unlikely	3	5	8	11	16
	1	Rare	1	2	4	7	15

Definitions - Calculated Risk

20 to 25= Extreme Risk	15 to 19= High Risk	7 to14= Medium Risk	1 to 6= Low Risk
Risk is unacceptable, STOP WORK Resident Manager Approval Required to Proceed	Risk is unacceptable, Area Manager approval required to proceed	Risk is undesirable, JHA must be produced and signed off before proceeding	Risk is considered tolerable, JHA to be produced. Sign off before proceeding

Definitions - Consequences

Level	Rating	Environmental Impact	
1	Insignificant	Isolated area low impact	
2	Minor	Contained low impact	
3	Moderate	Uncontained	
		impact able to be rectified in short term	
4	Major	Extensive hazardous impact	
		long term rectification	
5	Catastrophic	Uncontained hazardous impact residual effect	

Definitions - Frequency/Likelihood of Occurrence

FREQUENCY	LIKELIHOOD OF OCCURRENCE	ALPHA	Numeric
Almost Certain	 The event is expected to occur in most circumstances Happens all the time on almost every day or each time the activity occurs Greater than 50% of the time or several times or more per month Almost certain or the most likely and expected result if the selected complete sequence or scenario occurs 	Α	5
Likely	 The event will probably occur in most circumstances Happens often on almost every day or each time the activity occurs About 15% of the time or about once or twice per month Quite possible or not unusual 	В	4
Possible	 The event should occur at some time Happens occasionally/might occur at some time About 1% of the time or about once or twice per year Would be unusual but possible 	С	3
Unlikely	 The event could occur at some time Occurs only occasionally - once every 3-5 years About once in 1,000 times or could occur once or twice every 10 years Remote possibility of incident occurring 	D	2
Rare	 The event may occur only in exceptional circumstances Remotely possible/occurs in exceptional circumstances only May occur only in exceptional circumstances No known incidents after several years of exposure however it is possible an incident could occur 	E	1

5.6 Emergency Procedures and Incident Reporting

5.6.1 Environmental Emergency Procedures

Hydrocarbon Spills

Action required when a spill is identified includes:

- Isolate the spill area
- Identify the spilt substance
- Identify hazards and PPE Requirements
- If safe to do so, the source of the spill should be restricted or stopped
- If suitable equipment is readily available and can be operated in a safe manner, the extent of the spill is to be contained
- Complete incident report
- The Exploration Manager is to be advised;
- The General Manager is to be immediately advised in those cases where the spill has resulted in injury or has the potential to be a safety issue.

Techniques to restrict the Extent of the Contamination include:

If possible restrict the source of the spill

• If the spill is occurring outside a containment bund, use earthmoving equipment to construct additional earthen bunds to contain the extent of the flow

Techniques to collect Spilled Hazardous Substances

- Pump the hazardous substances from the source tank and/or the containment area into a second container
- Use absorbent materials to soak up residual hazardous substances.
- Use earthmoving equipment to excavate contaminated soil from earthen bunded areas for disposal as directed by the Environmental Department.
- Hazardous Substances contained in concrete bunds are to be drained/pumped into approved containers for disposal or recycling.
- Absorbent spill materials are to be collected and disposed of at a disposal area off -site.

Spills less than 20L can be cleaned up in situ, with contaminated materials contained in appropriate plastic bags and disposed of at an approved hazardous waste disposal facility (e.g. Alice Springs). An Incident Report must be filled out with all relevant information regarding the clean-up details, amount of soil cleaned up and where it was disposed of, and submitted to the Exploration Manager. The site's spill register must also be updated.

A spill greater than 20L is a loss of containment: where contamination of soil, land or water occurs. The spill area is required to be excavated and contaminated material taken to an approved hazardous waste disposal facility or remediation site (e.g. Alice Springs). The site supervisor, typically the senior geologist, is responsible for arranging excavation and removal of contaminated materials.

Disposal of contaminated material must be in the appropriate manner as described in the MSDS or hazardous substances register. Remediate any residual contaminated area in the appropriate manner as described in the MSDS or hazardous substance register.

Bushfire

Exploration vehicles will carry appropriate fire-fighting equipment, including fire extinguishers, backpack-mounted water containers fitted with spray nozzles,

Should a fire start in close proximity to a work area and there are facilities on hand to put it out and it is safe to do so, an attempt will be made to control the fire as quickly as possible with available firefighting equipment.

In the event that a fire cannot be controlled by the personnel on site, the company's emergency procedures will be followed. This procedure includes:

- evacuation of personnel from vicinity and path of the fire
- notification of external emergency services
- all other on-site personnel alerted and on standby
- water trucks and/or earthmoving equipment on standby if available

• notification of landholders as applicable

Uncontained Groundwater

Any groundwater brought to the surface during drilling operations is typically contained in sumps dug adjacent to the drilling rig. Excessive groundwater may potentially overflow the sump, resulting in possible contamination of surface soils by saline groundwater. In the event that such waters are likely to become uncontained, drilling operations will be temporarily suspended until the situation is rectified, by either:

- Diverting excess water into another containment sump, or
- Concluding the operation at the affected drill site until the water level of the containment sump is sufficiently reduced or additional sumps have been created

5.6.2 Management of Environmental Incidents and Identified Hazards

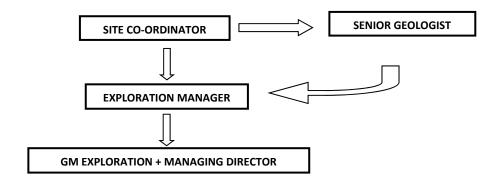
Environmental hazards Identified to date at the Tanami exploration project comprise:

- Hydrocarbon spills
- Bushfires
- Uncontained saline groundwater from drilling operations

All environmental incidents will be recorded and managed via the company's incident management process, outlined in the flow-sheet presented in Figure 2.

5.6.3 Incident Reporting Procedure

The company's internal incident reporting procedure is carried out by a standard incident report form, included within Appendix 5. The notification flowchart is outlined below:



All environmental incidents will be recorded in a site register. The severity of the incident will be assessed using the matrix provided in the *Draft Guideline - Environmental incident reporting under Section 29 of the Mining Management Act (July 2012)*, included in Appendix 5D as the Dept of Resources Environmental Incident Reporting Procedure.

As per Section 29 of the Mining Management Act, incidents rating Class 2 and above (as defined in the Guidelines) will be reported to the Chief Executive Officer of the DME, as soon as is practical after the incident has occurred. Initial notice will be given by telephone, and followed up with written notice as soon as practical (see Appendix 5D as the Dept of Resources Environmental Incident Reporting Procedure).

FIGURE 2: INCIDENT MANAGEMENT PROCESS Yes **Incident Occurs Emergency Situation? EMERGENCY RESPONSE Notify Emergency Communications Co-ordinator** No Logs details Initial Response Contacts Emergency Services • Make area safe • Contacts Area Emergency Controller Initial clean-up Contacts Exploration Manager Treat any injuries • Standby further communications **Exploration Manager Area Emergency Controller** Record Incident • Assess Emergency / Determine Severity • Requests callout services and key personnel **CLEAN-UP AND RECOVERY** • Delegates responsibilities Ultimate • Co-ordinate Emergency Services Authority • Mitigate environmental damage Liaise with key personnel Company MD • Confirm all safety and operating • Setup Emergency Control Centre (if required) Notify DME parameters met • Ensure site is secured • Ensure all personnel rested and fit • Liaise with emergency personnel to give ALL for work CLEAR when emergency concluded • Maintenance/replacement of equipment KEY PERSONNEL **RECOVERY** DEBRIEF Environmental Confirm all safety and coordinator operating parameters met **Notifications** • Emergency Services • Ensure all personnel rested Senior Geologist and fit for work • Exploration Manager GM Exploration Company MD **CLEAN-UP DEBRIEF** Ensure all relevant documentation • Emergency services to manage casualties • Ensure all relevant documentation completed, completed, incl Accident/Incident Report, • Emergency services to ensure decontamination as Accident/Incident Report, Departmental Reports, etc Departmental Reports, etc per MSDS • Notify appropriate departments, DME, etc • Notify appropriate departments, DME, • Cordon off area, warning signs as appropriate • Conduct incident investigation, determine cause and initiate etc. if required • Remove debris as necessary remedial action • Conduct incident investigation, determine • Maintenance/replacement of equipment • Controller to ensure injured personnel receive medical attention cause and initiate remedial action

• All other clean-up requirements

• Ensure injured personnel receive required

medical attention

5.7 Environmental Audits, Inspections and Monitoring

An Environmental Audit and Inspection on the project was undertaken at the end of the 2016 field season, and again in August 2017. Subsequent audits and inspections are planned on an annual basis, typically towards the end of each field season.

Audit of disturbed areas: The environmental audit comprised an inspection of all disturbed areas. At each site, disturbance was recorded, and a rehabilitation checklist is completed (Appendix 4A – Rehabilitation Checklist). The checklist documents any additional measures that may be required and the objectives for their implementation.

Ongoing Monitoring: A selection of previously disturbed areas were also reviewed as part of the audit and inspection process, and post-closure monitoring was included as part of the rehabilitation checklist.

A complete rehabilitation register of disturbed areas is presented in Appendix 4B. A comprehensive photographic record of all rehabilitation to disturbed areas is maintained and includes before/after imagery of disturbed areas, as well as additional photographs to reflect post-closure monitoring. Images of specific drill sites chosen for post closure monitoring are located in Appendix 4C.

5.8 Environmental Performance Reporting

5.8.1 Objectives and Targets

The current measurable objectives relevant to the specific environmental aspects and impacts for the **Tanami Project** include:

- Ongoing monitoring of rehabilitation activities pertaining to 2015-2016 drilling programmes. The most recent rehabilitation phase (August 2017) has effectively completed all of the remaining rehabilitation requirements on the license. This rehabilitation, along with previous reclamation activities from 2015 and 2016 will be monitored during the 2018 field season.
- A measurable basis for the rehabilitation works includes a comprehensive photographic record of rehabilitated areas. A selection of the photographic record is repeated on an annual basis and presented with the rehabilitation register in the MMP.
- Specific objectives pertaining to the rehabilitated sites include:
 - 1. Healthy re-establishment of natural vegetation on reclaimed areas
 - 2. No observed soil erosion as a result of exploration activities
 - 3. No spread of weeds from outside or within the project

5.8.2 Performance Reporting

The company has made significant progress with regard to rehabilitation of disturbed areas associated with drilling operations on EL26625. Rehabilitation has thus far been undertaken in three stages – September 2015, July 2016, and August 2017.

The findings of the August 2017 environmental audit are summarised:

- 1. Of 79 cleared drill pads on EL26625, rehabilitation is now completed for all 79. This includes a number sites in the last audit that were flagged as partially rehabilitated and requiring further attention.
- 2. All drill-holes were suitably plugged and backfilled on all rehabilitated sites.
- 2. Sumps were adequately backfilled on all rehabilitated sites.
- 3. Of 21.5km of access tracks, all 21.5km have now been rehabilitated. This includes several areas in the last audit that were flagged as requiring further ripping.
- 4. Drill sites rehabilitated in September 2015 and July 2016, prior to the last wet season have shown substantial regrowth and the company is satisfied with their progress to date.
- 5. The campsite used for drilling operations has been rehabilitated and all infrastructure removed.
- 6. No soil erosion or weed infestation was observed on the rehabilitated sites.

6. EXPLORATION REHABILITATION

Disturbance	Rehabilitation Activities	Schedule (Timing)	Closure Objectives / Targets	Monitoring and Remediation
Access tracks	Ripping of tracks if necessary (e.g. compacted or deeply rutted tracks, or topsoil significantly disturbed) Back-grade any windrows Remove obstructions from creek beds	At the completion of exploration programmes and when the access is no longer required, and prior to relinquishment of the exploration license	Disturbed areas rehabilitated and stable Reduce erosion rates to pre- existing levels	Monitoring and management to mitigate erosion and ensure site recovery. Sites are revisited within 6-12 months of initial rehabilitation activities to monitor
Drill Pads	Ripping where necessary (e.g. compacted areas or topsoil significantly disturbed) Sample material to be returned down the drill hole or buried in sump Return topsoil and any cleared vegetation to site Any soils contaminated with hydrocarbons or drill fluids to be removed from site and disposed of at an approved facility	As soon as reasonably practical after completion of drilling programme and access is no longer required. Prior to onset of next field season	Disturbed areas rehabilitated and stable Reduce erosion rates to pre- existing levels	rehabilitation activities to monitor the progress of site rehabilitation, assess the extent of erosion if present, ensure no rubbish or infrastructure remains on the site and assess the level of ground compaction. The requirement for further remediation will be triggered where monitoring has identified: • development of erosion, • opening and/or collapse of drill
Drill holes	Cut casing at 0.5m below ground level plugging with plastic cone below ground level, backfilling and mounding	Completion of each hole	All holes plugged and stable prior to end of program	 collars, failure of revegetation, weed invasion compacted areas
Sumps	Sumps to be backfilled to original ground level Topsoil and vegetation to be dispersed at the surface	As soon as reasonably practical after completion of drilling programme and use of the sump is no longer required. Prior to onset of next field season	Disturbed areas rehabilitated and stable Reduce erosion rates to pre- existing levels	Following further remediation (if required) additional monitoring will be undertaken every 6-12 months, until the area is fully
Costeans	Costeans to be backfilled as fully as possible with stockpiled subsoil and rock Return stockpiled topsoil and any cleared vegetation to site Sides to be battered and recontoured On sloping ground, drainage structures may need to be	As soon as reasonably practical after completion of mapping/sampling programme and use of the costean is no longer required. Prior to onset of next field season	Disturbed areas rehabilitated and stable Reduce erosion rates to pre- existing levels	rehabilitated.

	established to control erosion			Monitoring and management to mitigate erosion and ensure site recovery. Sites are revisited within
Bulk Sample Pits	Pits to be backfilled as fully as possible with stockpiled subsoil and rock Return stockpiled topsoil and any cleared vegetation to site Sides to be battered and recontoured On sloping ground, drainage structures may need to be established to control erosion	As soon as reasonably practical after completion of sampling programme and use of the pit is no longer required. Prior to onset of next field season	Disturbed areas rehabilitated and stable Reduce erosion rates to pre- existing levels	6-12 months of initial rehabilitation activities to monitor the progress of site rehabilitation, assess the extent of erosion if present, ensure no rubbish or infrastructure remains on the site and assess the level of ground compaction. The requirement for further
Sample Bags	Plastic bags will not be used for the drilling operation. All calico bags containing analytical samples to be removed from site at completion of the drilling	At completion of the drilling programme	Drill sites are free from any rubbish or sample bags	remediation will be triggered where monitoring has identified: • development of erosion, • opening and/or collapse of drill collars,
Сатр	Ripping of areas where necessary (e.g. compacted or deeply rutted tracks, or topsoil significantly disturbed) Removal of all rubbish and structures from site Remove or remediate any soil contaminated by fuel or chemical spills Filling of any sumps/drains/pits Return any stockpiled vegetation and topsoil over site	At the completion of exploration programmes and when the area is no longer required, and prior to relinquishment of the exploration license, unless requested otherwise by the landholder	Disturbed areas rehabilitated and stable, and free from any rubbish or structures Reduce erosion rates to pre-existing levels	 failure of revegetation, weed invasion compacted areas Following further remediation (if required) additional monitoring will be undertaken every 6-12 months, until the area is fully rehabilitated.

Note: the "Field season" is defined by seasonal weather and access restrictions and typically extends from March to November
Before and After photographs of selected disturbed areas are collected and submitted with annual Mine Management Plans, to demonstrate that rehabilitation activities have been carried out.