Gumatj Corporation Ltd (and Subsidiaries)

Dhupuma Plateau Bauxite Mine

Mining Management Plan
Gove, NT

Gulkula Mining Company Pty Ltd

November 2016

Mining Management Plan Checklist

Y/N		Department of Mines and Energy (DME) Comment
Y	Has the plan been endorsed by a senior representative of the company?	
Y	**Introduction:** Have Operator details been included?	
Y	Is the company structure described?	
Y	Are title details included?	
Y	Is there a project summary and description of improvements?	
Y	**Site Conditions:** Have all the physical environment conditions for the site and surrounds been identified?	
Y	Have the current land uses and users and stakeholders been identified?	
Y	Have Community Affairs been described?	
Y	**Statutory and Non-Statutory Requirements:** Has all legislation relevant to the operation and associated permits and approvals been identified? Have all non-statutory obligations been identified and included?	
Y	Have Aboriginal and heritage sites been identified?	
Y	**Operational Activities:** Have all operational activities relating to mining, processing, exploration and any related activities for the site been addressed in the MMP?	
Y	**Waste Rock Characterisation** Have results of waste rock characterisation been included and discussed? Has a waste characterisation report been included? Does the MMP include a waste rock management plan?	
Y	**Environmental Management:** Has the Environmental Management structure and responsibilities been outlined?	
Y	Has the Environmental Policy been included?	
Y	Has a register of environmental commitments been included? Has a summary of all recommendations from the Environmental Impact Assessment been included and addressed if the project has been formally assessed?	
Y	Has training and induction been addressed?	
Y	Is there an Environmental Emergency and response plan?	
Y	Have all environmental aspects and potential impacts been identified? Has a risk assessment been carried out?	
Y	Have Environmental Management Plans (EMP's) for identified risks been developed and included?	
Y	**EMP's:** Do all EMP's include: • objectives and targets • management and mitigation strategies • monitoring and measurement • discussion and analysis of results • non-conformances and corrective actions?	
Y	**Water Management:** Has a comprehensive description of surface water conditions been included?	
Y	Has a comprehensive groundwater model been described?	

Y/N		Department of Mines and Energy (DME) Comment
Y	Have information or knowledge gaps been identified and described for water management?	
Y	Are there comprehensive details (including scopes of work) on actions proposed to be taken to respond to any identified information or knowledge gaps?	
Y	Have hazards been identified that could result from activities related to the operation and rank the associated risks of impacts to both surface and groundwater?	
Y	Are all strategies and actions that will be undertaken to manage any risks identified included?	
Y	Has the water monitoring program been detailed?	
Y	Has all monitoring data been included?	
Y	Has an interpretation of data by a suitably qualified person been included?	
Y	Has a discussion of trends over time been detailed?	
Y		
Y	Have details of remedial/corrective strategies and scopes of work been included?	
Y	Have proposed actions been detailed?	
Y	**Incident Reporting:** Has a table of all incidents recorded on site been included and discussed?	
Y	**Closure Planning:** Has a Life of Plan – Unplanned Closure plan been included? Are all disturbances described? Are remediation activities that would be required in the event of unplanned closure described? Are activities required to achieve end land use objectives, described?	
Y	**Maps and Plans:** Maps and plans have scale, scale bar, legend and north point? Datums used are MGA94 or GDA 94 (expressed in decimal degrees) with elevations based on AHD?	

DHUPUMA PLATEAU BAUXITE MINE
MINING MANAGEMENT PLAN
Gove, Northern Territory

Operator: **GMC**
Project: **Dhupuma Plateau Bauxite Mine, Gove**
MMP: **Reporting Year 2016**

	Author	Reviewed by	Approved by
Name	Steven Vellacott Landroc Pty Ltd	Mark Annandale Pty Ltd	Klaus Helms, CEO, GMC
Signature			
Date			

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1 INTRODUCTION

1.1 Operator Details

Gulkula Mining Company Pty Ltd (GMC) was formed on 15 November 2011 by the Traditional Owners of the land that includes the Dhupuma Plateau on North East Arnhem Land. Gulkula's wholly-owned parent company, Gumatj Corporation Limited, was formed on 28 February 2007. GMC plans to establish a commercial enterprise, developing the bauxite mineral resources on traditional land in North East Arnhem Land.

The Company's head office is in Gunyangara, North East Arnhem Land, Northern Territory.

Operator details are outlined in Table 1.

Table 1: Operator Details

GMC Pty Ltd	**ACN:** 153 861 806 100%
Principal or residential address of applicant/s: Lot 26 Guymal Amurra Road Gunyangara via Nhulunbuy NT 0881	
Postal address of applicant/s: PO Box 1220, Nhulunbuy NT 0881	
Contact telephone numbers: Klaus Helms (08) 8987 2139 Steve Vellacott 0419 823 503	**Fax number:** (08) 89871716
Email Address: Klaus.Helms@gumatj.com.au; cc: steve.vellacott@landroc.com.au	

1.1.1 Organisational Structure and Responsibility

Figure 1: Outline of the organisational Structure of GMC

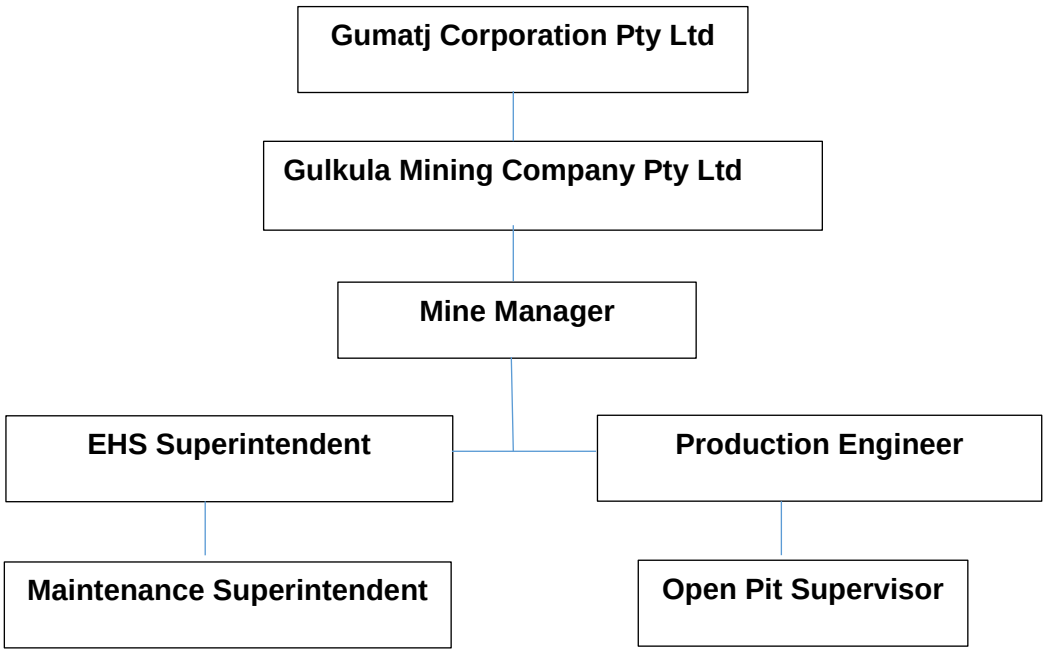


Table 2: Responsibilities

Job title	Responsibilities	Name
Mine Manager	Responsible for all operational matters, including environment, health, and safety performance.	Position being filled
Production Engineer	Directs operational activities and manage on-site personnel performance.	Position being filled
Environmental Health and Safety (EHS) Superintendent	Responsible for maintaining the EHS Management System; Mining Management Plan Compliance, providing inductions, and arranging on-site training for personnel.	Steven Vellacott
Open Pit Supervisor	Production and crew management. Ensure the equipment is safely operated with respect to floor conditions and dust suppression.	Position being filled
Maintenance Superintendent	Maintenance planning, parts ordering and inventory control. Mentoring and supervision of the workshop area and tools. Managing overflow work and major servicing with maintenance contractors.	Position being filled
Sub-consultants	Engaged as required for specialist environmental and other mine related services.	Specialists as required

1.2 Title Details

GMC plans to establish a commercial enterprise, developing the bauxite mineral resources on their traditional land in North East Arnhem Land. The proposed mining area is located on Aboriginal freehold land.

GMC has an approved Exploration Agreement with the Arnhem Land Aboriginal Land Trust administered by the Northern Land Council. On 14 May 2014, the Northern Land Council gave its consent to the granting of an Exploration Licence (EL) over EL30226 to GMC. GMC was also informed on 15 August 2016 by the NLC that the NLC has given its consent to the granting of a Mineral Lease (ML31025) to GMC at Dhupuma Plateau.

Table 3: Current Exploration Licence and Mineral Lease

Title number	Title holder	Grant Date	Expiry Date
EL30226	GMC	11 Aug 2014	2030
ML31025	GMC	TBC	TBC

1.3 Project Description

The name of this project is Dhupuma Plateau Bauxite Mine. The location and proposed layout of the project is shown in Figure 2 to Figure 5.

The GMC project is a low impact, small scale bauxite mining operation. The extent of disturbance will be much lower than most other bauxite mining operations. There will be:

- No processing of bauxite ore at the Dhupuma mine site.
- No crushing or screening
- No requirement to wash or otherwise treat bauxite ore; and
- No requirement to manage or dispose of tailings.

Explosives will not be required. There will also be no significant infrastructure or buildings located on site, other than a small office and shade area, a small ore stockpile area and haul roads.

A Mining Training Centre (MTC) will be established, to train and employ Indigenous people from North East Arnhem Land and other regions of the Northern Territory. The MTC and GMC mining operations will provide significant Indigenous employment and training opportunities that will support both regional development and broader Indigenous community benefits in the Northern Territory.

The mining operation will extract commercial value from mining bauxite over a period of 15 years. Production will ramp up from 100,000 tonnes per annum (tpa) to 500,000 tpa over the first four years and is anticipated to maintain an annual production of 500,000 tonnes for the life of the mine.

A total estimated disturbance of 35 ha is planned in the first four years of mining, including mining areas and infrastructure. From project-year five onwards, an estimated 15 ha per year is planned to be disturbed by mining.

A key element of the MTC is to provide real mine operational experience through accredited training whilst ensuring that trainees accrue significant experience and hours on key mining plant and machinery.

1.3.1 Location

The Dhupuma Plateau Bauxite Mine is located approximately 30 km south by road from the town of Nhulunbuy on the Gove Peninsula, as shown in Figure 2. GMC has a Mineral Lease (ML31025) located within the Exploration Licence Area (EL30226). EL30226 remains in place, underlying (ML31025). Figure 2 to Figure 4 indicate the location of the Mineral Lease, surrounding towns, existing mining areas and roads.

Figure 2: Location of EL30226 and Dhupuma Plateau (yellow line within EL30226)

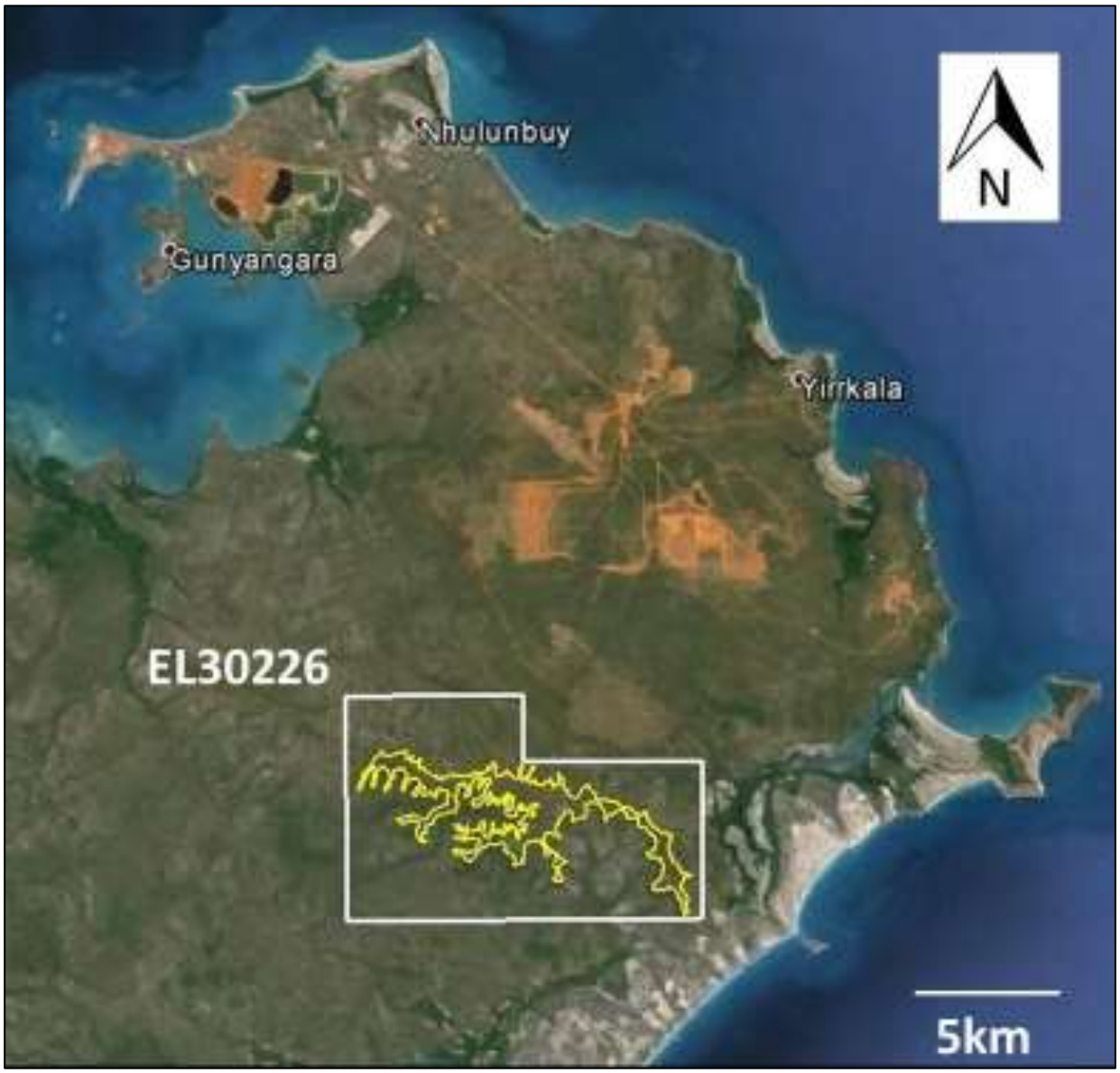


Figure 3: Dhupuma Plateau, ML31025 (marked in red) and EL30226 (marked in black)

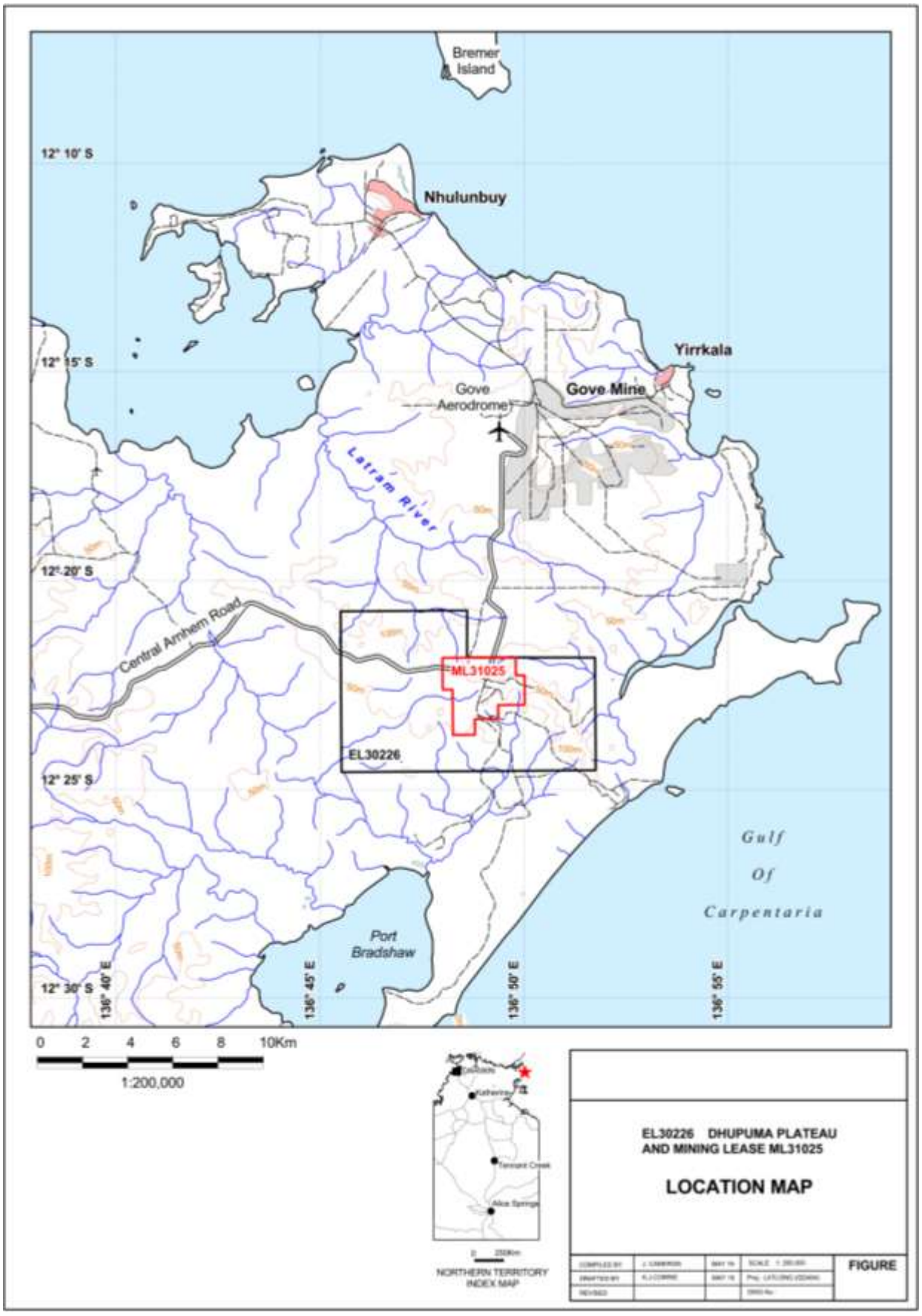


Figure 4: Boundary and Coordinates of ML31025

The proposed mine site is dissected by the Central Arnhem Highway from Nhulunbuy to Katherine. Access to North East Arnhem Land, and use of the road requires a permit administered by the Northern Land Council. Figure 5, indicates approximate alignment of a preferred 4km haul road linking the Dhupuma Plateau bauxite transport route and Rio Tinto haul route.

It is planned that the bauxite mined from Dhupuma Plateau will be sold to Rio Tinto's Gove operations (SML11) where Rio Tinto will crush, load, ship and on-sell. A fleet of 5-13 small trucks have been proposed as the primary truck fleet. These trucks will be loaded directly at the mine face and haul the bauxite approximately 14km to the Rio Tinto hardstand stockpile. Figure 5 indicates the preferred haul road link between Dhupuma Plateau and the Rio Tinto hardstand Stockpile.

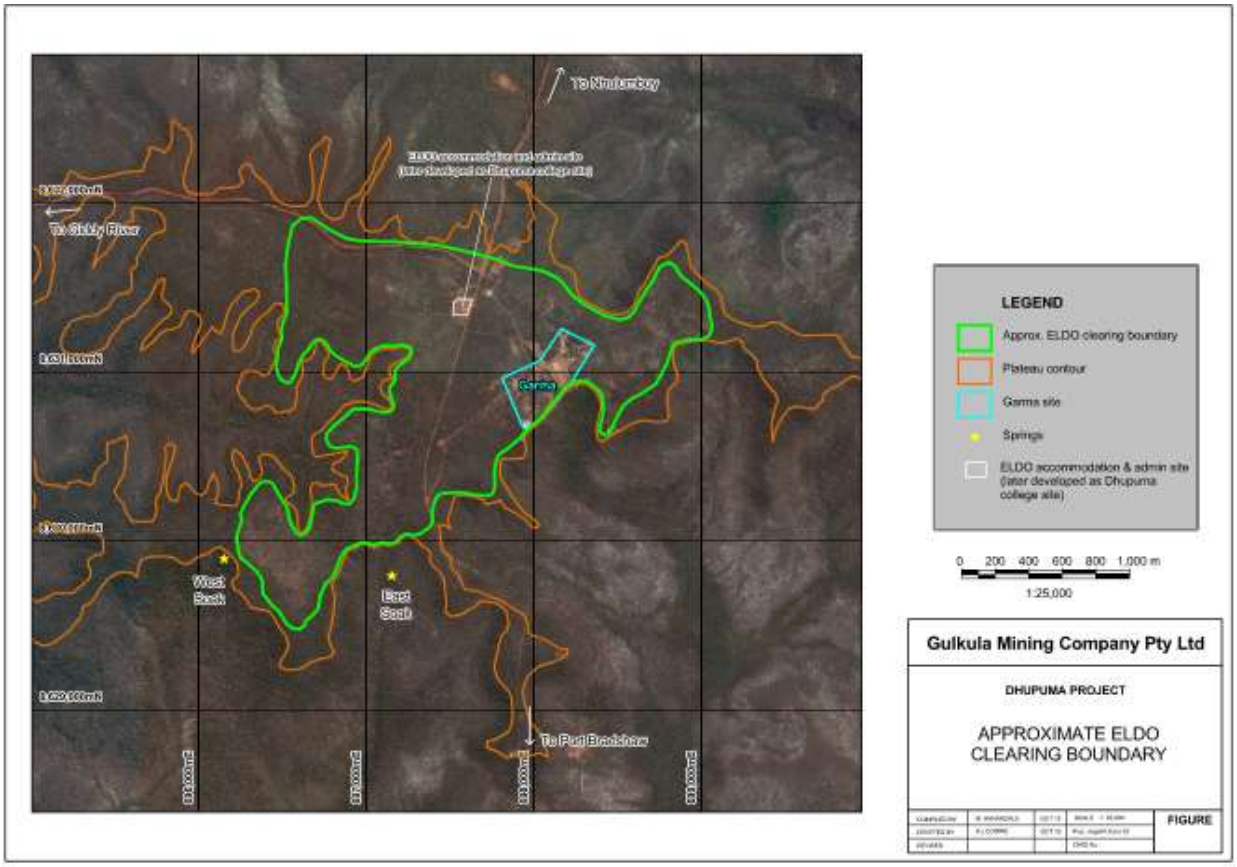
Figure 5: Approximate Location of 4km Haul Road Link

1.3.2 Project Summary and Improvements

The land on which ML31025 occupies has not previously been mined, however, the proposed mine site was cleared of vegetation and soils for the European Launcher Development Organisation (ELDO) tracking station site in the 1950/60's.

The ELDO administration and accommodation areas were later used by the Dhupuma residential college for Indigenous children (1970s until 1980) and then further used by Gumatj over the past several years, as the Gumatj sawmill site. The ELDO project left behind several thousand tonnes of waste materials in the lease area. Other historic disturbances to the area include extraction of road base material for the construction and maintenance of the East Arnhem Highway. Figure 6 shows the approximate extent of clearing conducted for the ELDO Tracking Station.

Figure 6: Approximate Extent of Clearing conducted for ELDO Tracking Station 1950s to 1960s



GMC completed a maiden drilling program in 2014 and a resource model was completed in early 2015. This mining inventory is the basis for the mine production schedule. It is planned that the bauxite mined from Dhupuma will be sold to Rio Tinto Gove operations where Rio Tinto will crush, load, ship and on-sell.

Further drilling is expected to increase the overall resource base. As soon as regulatory approvals have been completed, mining and related activities will be undertaken on the surface of the plateau.

Bauxite reserves are shallow and at surface. Buffer zones will be established for the edges of the plateau and exclusion zones for heritage and habitat protection.

The proposed mining operations are simple, involving no treatment of ore, no processing of tailings, and no explosives.

2 SITE CONDITIONS

2.1 Physical Environment

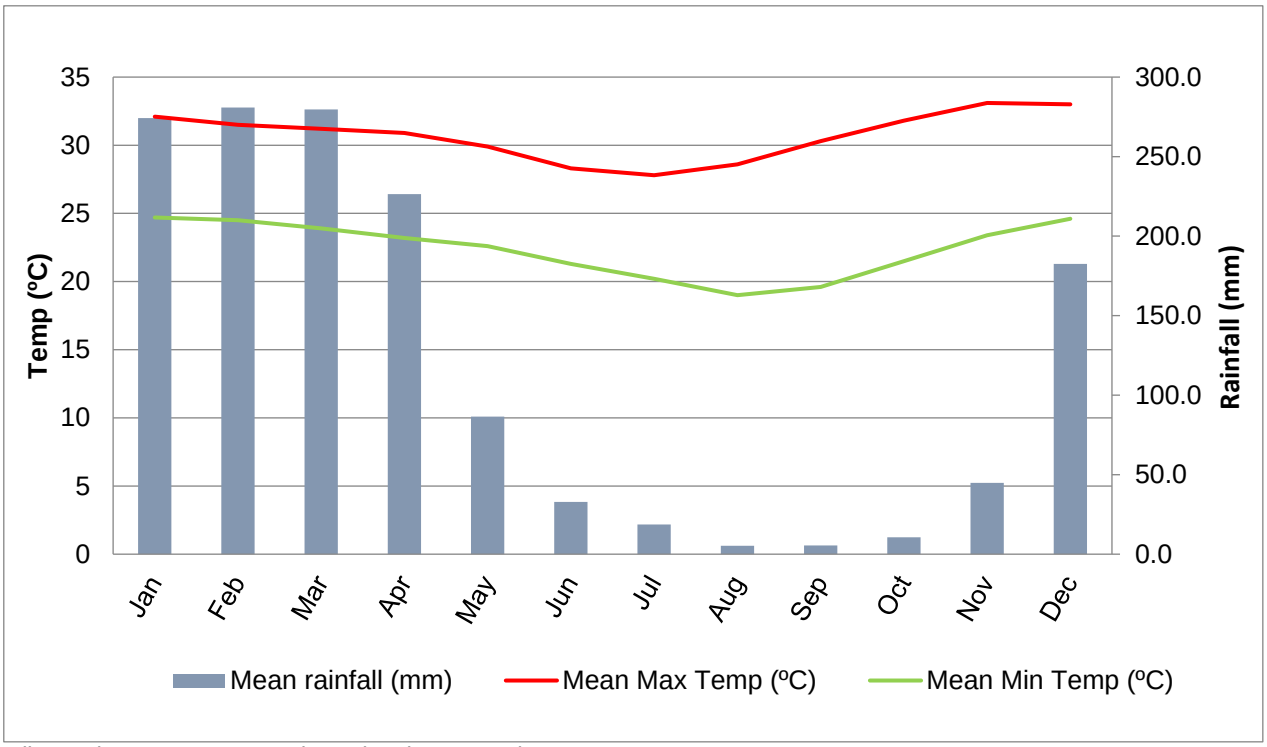
2.1.1 Climate

EL30226 is located within the wet-dry tropics and experiences a dry season (approximately June to October) and a wet season (November to May). Figure 7 shows climate data from Gove Airport Bureau of Meteorology (BoM) station 14508, located approximately 30 km north-west of the proposed mine site. EL30226 is located in an area that can be subject to cyclonic conditions during the wet season. The area was most recently impacted by Cyclone Marcia (February 2015).

Annual average rainfall in the Gove area is 1450mm, the bulk of which occurs during the wet season, with negligible rain between June and October. The wettest months are January, February and March with averages of 274 mm, 281 mm and 280 mm of rain, respectively. The average pan evaporation rate is approximately 2,000 mm per annum (Bureau of Meteorology, 2016). Temperatures range from a highest mean maximum of 33.1°C in November to a lowest mean minimum of 19.0°C in August.

Mean monthly wind speed recorded at Gove Airport (Station 014508) ranges from 11.4 km/h (March) to 22.1 km/h (June). Wind speeds are generally higher in the dry season months, when prevailing winds are south-easterly. During the wet season, monsoonal weather from the northwest is more typical. On average, throughout the course of a year, wind direction is predominantly east-south-east in the morning and north-west in the afternoon. (Information Courtesy BoM, 24 May 2016).

Figure 7: Temperature and Rainfall Means, Gove NT

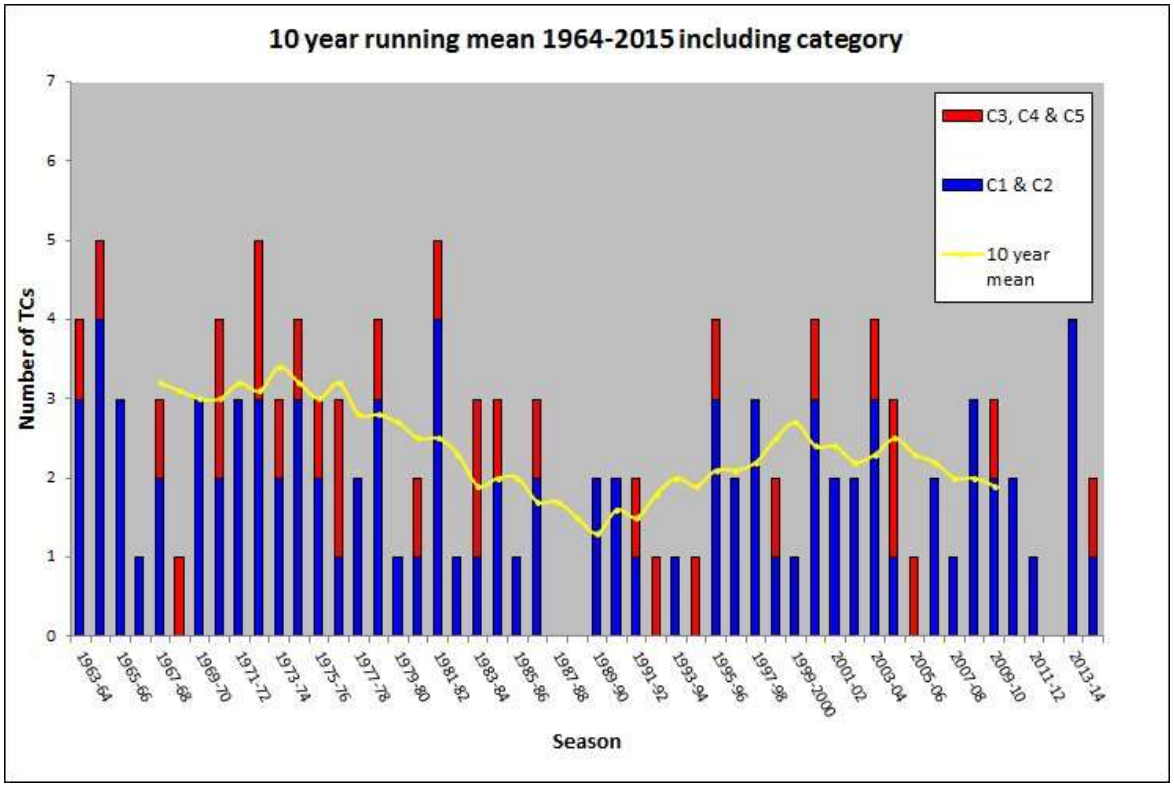


Climate data Source- Gove Airport (Station 014508)

Records at Gove Airport (site number 14508), located approximately 20 km north of MLA31025, show that the highest daily rainfall event recorded was 268.8mm on 17th March 1980. Other locations in the Northern Territory have experienced higher rainfall events. These include a daily record for the Northern Territory of 544.6mm in the Roper Valley on 15th April 1963. The highest monthly rainfall on record in the Northern Territory was 1149mm in Maningrida on 12 March 1981 (BoM, 2015).

The BoM provides statistics (examples below) on the frequency and intensity of cyclones that occur in the Gove region and surrounding areas. (Information Courtesy BoM, 24 May 2016).

Figure 8: Running Mean for Frequency and Intensity of Cyclones



The Dhupuma Plateau is elevated in the landscape and therefore exposed to cyclonic winds, on average, every two years. Cyclonic winds can affect the safety of personnel. Emergency plans coordinated with local emergency services ensure there is time to prepare for such events. For example, in the event of a cyclone approaching the operational area, personnel will initiate the preparation and shut-down phases of the cyclone action plan, then upon advice from the Emergency Services and instructions from site management, personnel will move to designated shelters.

Plans will also be finalised to secure equipment and ensure natural drainage systems are made ready to manage water flows.

2.1.2 Land Systems

Topsoil and Subsoil

Bauxite and lateritic boulders cover most of the Dhupuma Plateau. Soils on the plateau are very shallow, or non-existent. They have very low nutrient content, and very low biological activity. Only a thin A horizon of low organic content is generally present. These soils are characterised by the presence of hydrated oxides of iron and aluminium, which remain in the soil after other elements have been removed.

Topography and Geology

EL30226 lies within the transition zone between the Arafura Fall and Gulf Fall physiographic sub-divisions due north of Port Bradshaw (Rawlings et al 1997). The tenement surrounds the Dhupuma Plateau which has an average elevation of approximately 105m and a gentle southerly slope with steep breakaways on the northern and southern sides including tributaries draining respectively to the Latram River, Dalywoi Bay and Port Bradshaw.

The deposit type sought is lateritic bauxite derived from the weathering of aluminous sediments in a tropical to sub-tropical environment. Up to eight discrete layers are recognised in a complete bauxite laterite profile including from surface: topsoil; loose pisolite bauxite; cemented pisolitic tubular bauxite; lower nodular bauxite; nodular ironstone; mottled zone; and saprolite.

In general, the bauxite mineralogy of the Gove deposits is composed of gibbsite and minor boehmite, particularly in the upper levels of the profile. Silica is present as free quartz and in kaolinite and haematite and goethite are the main iron oxide constituents.

2.1.3 Flora and Fauna

Flora and Vegetation (Andrew Mitchell June 2015)

Flora and vegetation surveys were conducted in a dry season and a wet season. The flora and vegetation survey covered all areas within the proposed mining lease. The footprint of the proposed mine was intensively surveyed. Outlying areas were viewed from the air and were surveyed where there was road access. Potentially sensitive areas in close proximity to the proposed mine and areas that may be hydrologically connected to the proposed mine site by surface water or groundwater were also intensively investigated.

The survey methodology was based on the Northern Territory Government (NT) Guidelines for Vegetation Survey and Mapping. Searches for threatened species focused on listed threatened species under the Territory Parks and Wildlife Conservation Act (obtained from www.nt.gov.au/ipe/pwcnt) and from the Commonwealth Governments Protected Matters Search Tool. The survey was undertaken in three stages with a preliminary survey in May 2014, a dry season survey in October 2014 and a wet season survey in May 2015.

No listed threatened species were observed within the potential mine footprint during field surveys to date. The Commonwealth Environmental Protection and Biodiversity Conservation Act's Protected Matters Search Tool did not list any plants or vegetation types for the Gove Peninsula.

The full report on flora and vegetation is provided in Appendix 2.

2.1.4 Terrestrial Fauna Surveys and Assessment *(Eco-Smart Ecology, July 2015)*

The terrestrial fauna survey was carried out by Eco-Smart Ecology during the 13th-19th November 2014 and the 20-26th of May 2015 (inclusive). The work focused on a 500ha area of land on the Dhupuma Plateau, approximately 30km southwest of the township of Nhulunbuy in Arnhem Land, Northern Territory. A total of 97 species were recorded during the survey.

The study fulfils the requirements of a terrestrial fauna survey and assessment, informed by the following relevant Territory and Commonwealth legislation and policy, where appropriate:

- Territory Parks and Wildlife Conservation Act (1977),
- Guidelines for Assessment of Impacts on Terrestrial Biodiversity (2013),
- Environmental Assessment Guidelines for the Northern Territory: Terrestrial Fauna Survey (2011),
- Guidelines on Environmental Offsets and Associated Approval Conditions (2013),
- Environmental Protection and Biodiversity Conservation Act (1999) (EPBC Act),
- Relevant survey guidelines for MNES frogs, reptiles, mammals and bats (DEWHA 2010; 2010; 2010; DSEWPC 2011; 2011), and
- EPBC Act Environmental Offset Policy (2012).

The complete 2015 Terrestrial Fauna Survey Report is provided in Appendix 6.

Since the completion of the fauna Survey in 2015, the Gove Crow Butterfly and the Black-footed Tree-rat have been the subject of further consideration regarding habitat areas approximately 850m or more, from the proposed mining operations. Both species are listed as “Threatened fauna” in the EPBC Act list.

2.2 Socio-economic Environment

The Traditional Owners of the land are the Gumatj people. The Gumatj people will own and operate the mine, which will be the basis for the development of the mine and the MTC. The objective is for the Gumatj people to become self-sufficient by building capacity of Yolngu people for long term sustainable business and Indigenous employment opportunities.

The Gulkula mine and the MTC are two of a portfolio of Indigenous businesses run by the Gumatj Corporation.

The curtailment of alumina refining at Rio Tinto operations in 2014 at Gove has the potential to significantly reduce economic opportunities and community well-being for Yolngu people in North East Arnhem Land. However, GMC has conservatively planned its activities based on a projected 10-15 year life of Rio Tinto's bauxite mining operations. This provides an opportunity for Gumatj, Rio Tinto and government to work together for delivery of strategies that foster long term social and economic development. These strategies will support the move from welfare and royalty dependency, to new, sustainable Indigenous businesses and employment after mining.

Rehabilitated areas will be returned to the Traditional Owners after mining. This will require ongoing management, requiring Rio Tinto skills. Rio Tinto and Gumatj, working closely with government, will provide training to Gumatj people to develop their mine rehabilitation management skills. This will help build broader opportunities for Gumatj people to derive benefits from mine rehabilitation areas.

There are many management requirements to be addressed when rehabilitating mined land. For example, mine rehabilitation may require certain end points to be met. These end points can be tailored to meet a range of agreed environmental, cultural and commercial values. These varying requirements provide additional training opportunities and skill development for Indigenous trainees.

As a key output of mine rehabilitation, forestry plantations can produce high value timber products that can be scaled up over time, as skills, experience and confidence grow. Forestry will generate wider community benefits, generating regional economic development and diversification.

The Gumatj Vision is to:

- Develop skills in mine rehabilitation; to establish and manage mine rehabilitation areas
- Establish forestry plantations as an investment in Gumatj's future
- Establish Indigenous owned and operated forestry business on Traditional Owners' land
- Build the foundation of Indigenous business and employment through MTC training
- Increase productivity from existing Gumatj natural forest salvage and sawmilling.

The MTC is a collaborative initiative between Gumatj, Rio Tinto and Government. The MTC and its partners will help realise the Gumatj vision.

2.2.1 Current Land Use

Land uses within the project site are outlined in this section.

The Garma Festival Site and associated infrastructure occupies part of the Dhupuma Plateau, within EL30226. Over a period of around two weeks each year, approximately 2,000 people attend the annual Garma festival at this location, which is run and managed by the Gumatj people.

Until August 2015, a small scale sawmill, owned and operated by Gumatj Corporation was located within ML31025, on the old ELDO and Dhupuma College site. The saw-mill was removed from the site in 2015. The remaining infrastructure at this site, including concrete slabs, sheds, ablution block and fencing will be used for the machinery, workshop and administrative activities.

2.2.2 Identified Stakeholders

The following organisations and representatives of local people have been identified as relevant stakeholders in relation to proposed mining activities. Each organisation has been directly consulted regarding the proposed mining activity. Responses from these organisations show strong support for the Gumatj Traditional Owners to have the opportunity to develop their own mining operation and train Yolngu people in mining and rehabilitation practices.

Stakeholders include:

- Northern Land Council (responsible for confirming Native Title Rights)
- Rio Tinto (offering support and assistance)
- Dhimurru Aboriginal Corporation (sharing information on flora, fauna, pests and other information related to protection of the local environment)
- Gumatj Corporation Ltd (and subsidiaries, providing support to GMC) (owned by Traditional Owners)
- Gumatj People (Traditional Owners of the Land in and around the lease area and owners of GMC, Gumatj Corporation, Garma Festival site and infrastructure)
- GMC (Exploration Licence Holder, owned by Traditional Owners)
- Aboriginal Areas Protection Authority (responsible for protecting Aboriginal Areas)
- Department of Mines and Energy (principal regulator)
- Northern Territory Environment Protection Authority (EPA)
- Employees and Trainees (yet to be appointed/selected)
- Northern Territory Government
- Commonwealth Government
- Bushfires NT

Workforce Description and Demography

The mining operation will require five senior and skilled personnel and trainees, who will be supported by both trainers and the professional staff who will also act as mentors. The following positions will be filled, to establish and operate the mine.

- Mine Manager
- Production Engineer
- EHS Superintendent
- Open Pit Supervisor
- Maintenance Superintendent
- 24 x trainees (training in machine operations, rehabilitation, maintenance, environmental monitoring, camp management, catering, administration etc)

Part time contractors will be engaged to provide ancillary services, such as mobile fuel supply; minor maintenance and repairs for power supply, water supply and communications systems.

The trainees will attend the MTC for class-room training and on-the-job training and real work experience including mining operations and accrual of hours operating plant and equipment.

GMC staff will be selected, based on skills, qualifications and experience in mining operations and direct experience working closely with Indigenous people. Full time employees will be housed in the town of Nhulunbuy. Trainees will be accommodated in the MTC accommodation located at the Garma site.

Community Affairs

The Gumatj people are the Traditional Owners of the proposed Dhupuma mine area. They are also the Traditional Owners of land surrounding the Dhupuma mine area. The wholly Indigenous owned and operated mine as well as MTC is a unique example of how Indigenous people can realise new opportunities and determine their future prosperity, to invest in themselves.

The proposed mining operation at Dhupuma Plateau will be established to support Gumatj people develop their own economy and community harmony. The Gumatj people have invested, and will continue to invest in forestry and timber resources as well as their own bauxite mining operations.

In 2015, the MTC was established by the Gumatj people, through construction of onsite infrastructure at Garma festival site ready to commence training in 2016. It will employ Indigenous people across North East Arnhem Land, providing trainees with a combination of classroom training and on-the-job experience to ensure that the competency and hands on experience requirements of the Australian mining and allied industries.

3 STATUTORY AND NON-STATUTORY REQUIREMENTS

3.1 Statutory Requirements

3.1.1 Primary Statutory Requirements

Aboriginal Land Rights Act (NT) Act (Commonwealth) – Providing for the granting of Traditional Aboriginal Land in the Northern Territory for the benefit of Aboriginals, and for other purposes.

Mineral Titles Act and Regulations (NT) – Regulates the exploration for, and extraction and processing of minerals and extractive minerals in the Northern Territory. Particularly, the Act: establishes a framework for granting and regulating mineral titles that authorise exploration for, and extraction and processing of mineral and extractive minerals; and facilitates the commercialisation of activities conducted under mineral titles.

Mining Management Act and Regulations (NT) – Provides primarily for the authorisation of mining activities, the management of mining sites, and the protection of the environment on mining sites.

Environmental Assessment Act (NT) – Provides for the assessment of the environmental effects of development proposals and for the protection of the environment in the Northern Territory.

Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth) – Provides for the protection of the environment and the conservation of biodiversity, particularly those matters of national environmental significance.

3.1.2 Secondary Statutory Requirements

Aboriginal and Torres Strait Islander Heritage Protection Act (Commonwealth) – Preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.

Biological Control Act (NT) – Provides for the biological control of pests in the Northern Territory and related purposes.

Biological Resources Act (NT) – An Act to provide for and regulate bioprospecting in the Territory and to related purposes.

Biological Resources Regulations (NT) – Regulates bio-discovery and related activities.

Building Act and Regulations (NT) – To establish, maintain and improve building standards.

Bushfires Act (NT) – Provides for the management and suppression of bushfires in the Northern Territory.

Bushfires Regulations (NT) – Regulates activities that may cause fires and manages fire management and control.

Control of Roads Act (NT) – Provides for the administration and control of roads, including the maintenance of roads and construction of roads.

Dangerous Goods Act (NT) – Regulates safe handling and transport of dangerous goods in the Northern Territory.

Emergency Management Act (NT) – Planning and coordination of emergency Management across the Northern Territory.

Environmental Offences and Penalties Act (NT) – Establishes a penalty structure for environmental offences based around 4 offence levels.

Food Act (NT) – Regulation of food handling and sales.

Heritage Act 2011 and Regulations (NT) – Relates to the natural and cultural heritage of the Northern Territory and provides for the conservation of the cultural and natural heritage of the Northern Territory.

Mineral Titles Regulations (NT) – Provides the mechanisms for determining and administering mining titles.

Northern Territory Aboriginal Sacred Sites Act (NT) – Provides for a practical balance of the recognised need to preserve and enhance Aboriginal cultural tradition and the aspirations of the Aboriginal and all other peoples of the Northern Territory for their economic, cultural and social advancement.

Plant Health Act and Regulations (NT) – Provides for the management and control of plant pests.

Parks and Wildlife Commission Act (NT) – An Act to establish a Commission to establish and manage, or assist in the management of, parks, reserves, sanctuaries and other land to encourage the protection, conservation and sustainable use of wildlife, to establish a land-holding corporation in connection with those purposes, and for related purposes.

Public and Environmental Health Act 2011 (NT) – Relates to public and environmental heath, including the ability to monitor, assess and control environmental conditions, factors and agents, facilities and equipment and activities, services and products that impact on or may impact on public and environmental health.

Soil Conservation and Land Utilisation Act (NT) – Makes provisions for the management of soil erosion and for the conservation and reclamation of soil.

Waste Management and Pollution Control Act (NT) – Provides primarily for the protection of the environment through encouragement of effective waste management and pollution management and control practices.

Water Act and Regulations (NT) – Provides for the investigation, allocation, use, control, protection, management and administration of water resources.

Weeds Management Act 2001 and Regulations (NT) – Aims to protect the Northern Territory economy, community, industry and environment from the adverse impact of weeds by minimising the spread of weeds, ensuring community consultation in the creation of weed management plans and ensuring the community has responsibility in implementing weed management plans.

Weeds Management Regulations (NT) – Enables Issue of infringement notices related to spread of weeds

Work Health and Safety (National Uniform Legislation) Act 2011 and Regulations (NT) – Regulates work health and safety, primarily by providing for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.

Aboriginal Areas Protection Authority – The Act is for the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.

3.2 Non-Statutory Obligations

The Gumatj people are the Traditional Owners of the proposed mining lease. The proposed mining area is located on Aboriginal freehold land.

GMC has an approved Exploration Agreement with the Arnhem Land Aboriginal Land Trust administered by the Northern Land Council. On 14 May 2014 the Northern Land Council gave its consent to the granting of an Exploration Licence over EL30226 to GMC.

GMC adopts environmental best practice initiatives appropriate for the region. Bauxite mining at Gove has been conducted for over 40 years. Best practice land rehabilitation techniques have been consistently applied over the area that is now operated by Rio Tinto. There is substantial evidence within the rehabilitated areas to indicate that the standard of rehabilitation is among the best in Australia. The rehabilitation techniques are well documented and are well known to the rehabilitation specialists advising GMC.

3.3 Sacred, archaeological and heritage sites

The Northern Territory Heritage database does not indicate any heritage sites in the proposed mining lease area or the current exploration licence area. The nearest registered site is Wurrwurrwuy (stone pictures) within the area known as Manydjarraarrna-Nanydjaka. The stone pictures are approximately 13 km to the east northeast of the proposed mining area.

A preliminary inspection of the Dhupuma plateau application area was undertaken during the week of 28-31 April 2014, by GMC representatives and including senior Traditional Owners for the area. No historical or heritage sites identified in the area are proposed for exploration.

A Heritage and Sacred Sites field avoidance assessment was conducted over EL30226 in June 2015. The Traditional Owners of the land (Gumatj elders) participated in the survey.

No heritage, Sacred Sites, objects or other items of heritage significance were identified during the Survey, however, the Aboriginal Areas Protection Authority (AAPA) has identified an area to the east of the proposed mining area that has since been established as an exclusion zone. GMC respects the AAPA's decision to establish an exclusion zone and GMC will ensure that no mining, exploration or any other activity related to mining, occurs in the exclusion zone. A full report on the Heritage and Sacred Sites avoidance assessment is provided in Appendix 3.

4 OPERATIONAL ACTIVITIES

4.1 Mining Activities

The Dhupuma bauxite project represents a simple, low technical risk entry point into mine operations and bauxite sales for GMC. The mine will also provide the MTC with an operating environment for the mine trainees to practice their skills.

Whilst the resource is small, the alumina and silica grades are favourable compared to other bauxite projects in the region. The bauxite is approximately 2.3 m thick and is overlain by very little overburden. As outlined in Section 1.3, the proposed operational activities are limited to extraction and transport of bauxite ore, with no on-site processing required.

GMC completed a maiden drilling program in 2014 and a resource model was completed in early 2015. This mining inventory is the basis for the mine production schedule. Al_2O_3 and SiO_2 grades referred to are defined as Total Chemical Alumina (TCA) or Total Silica respectively, unless otherwise stated. It is planned that the bauxite mined from Dhupuma will be sold to Rio Tinto Gove operations where Rio Tinto will crush, load, ship and on-sell.

The mine will include a ramp up from 100,000 tpa to 500,000 tpa over the first four years. A total estimated disturbance of 35 ha is planned in the first four years of mining, including mining areas and infrastructure. From project year-five onwards, an estimated 15 ha per year is planned to be disturbed, predominantly from mining.

Further drilling is expected to increase the overall resource base and may allow for a lower silica mine plan (i.e. higher revenue) due to more selective mining.

4.1.1 Mine Design

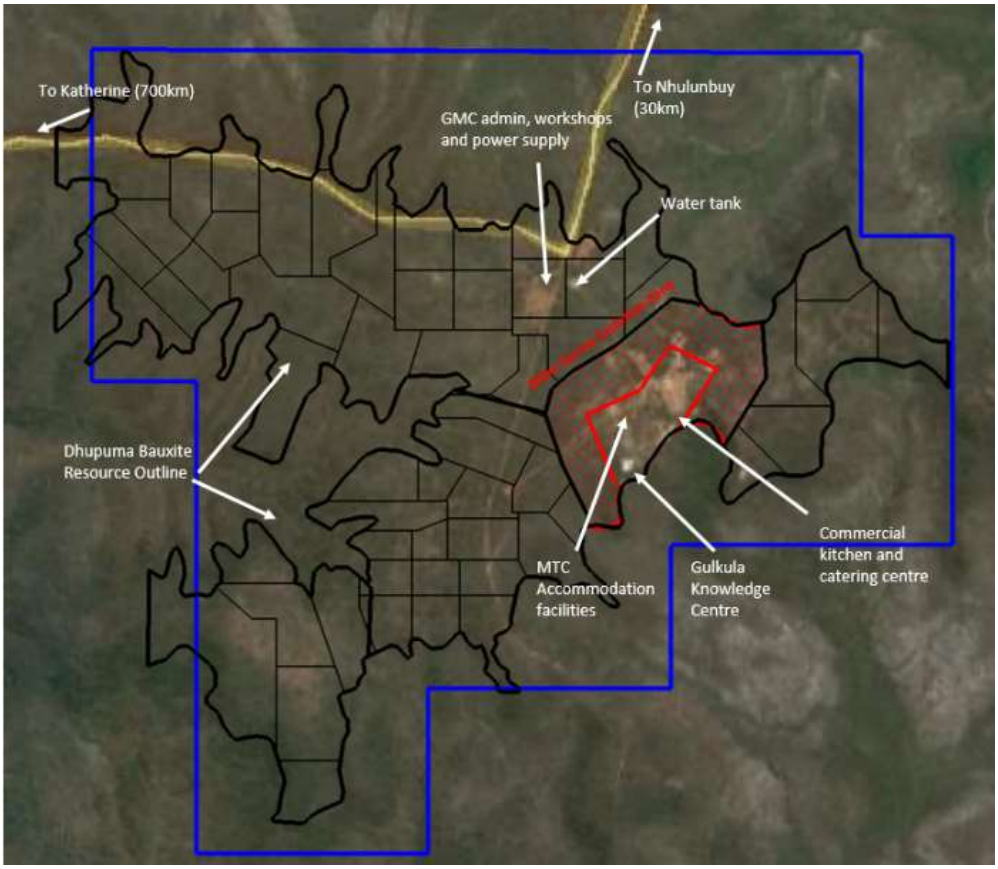
The initial required mining fleet will use front end loaders, or other similar machinery to dig and load bauxite and any over-burden that may be present. A fleet of trucks to haul ore will be loaded directly at the mine face and haul the bauxite approximately 14 km to the Rio Tinto hardstand stockpile. There may be an opportunity to use a local contractor to conduct the haulage activity. The loading fleet will be supported by a dozer, or equivalent machine, a grader and a watercart.

The peak fleet size will occur from project year four, once the mine reaches 500,000 tpa. To achieve this mining rate, additional trucks will be required.

Two additional critical activities for GMC will be the training of Indigenous people through the MTC in environmental management, and achieving best practice rehabilitation. This will include management of weeds, animal pests and pathogens.

Figure 9 provides an outline of the areas that will be utilised for mining and mining related activities as well as accommodation facilities. The site previously used for saw milling can also be seen immediately south of the road junction (see “GMC Admin, workshops, power supply, water tank). This area is now referred to as the GMC hard-stand.

Figure 9: Dhupuma Site and Infrastructure



4.1.2 Waste Rock Dump

The mining operation will not generate waste rock as the bauxite ore at, or near surface. The chemistry of the bauxite in the Gove area is very well understood from more than 40 years of bauxite operations at Gove. Chemical analysis of samples taken at Dhupuma Plateau confirm that Dhupuma Plateau bauxite very closely matches the ore at Rio Tinto's mining operations. Therefore, there is no need for a specific management plan for waste rock.

4.1.3 Mining Reserves and Geology

Mining Reserves

Current estimates indicate bauxite reserves of approximately 8-12 Million tonnes on the Dhupuma Plateau.

Figure 10 shows the approximate planned sequence of mining. The mining sequence is governed by the concentration of silica in the ore, which increases as mining progresses westwards along the plateau. In addition, the area on the eastern side of the north-south road dissecting the Dhupuma Plateau including the Garma site are currently part of a cultural Aboriginal Areas Protection Authority (AAPA) exclusion zone. GMC will not carry out any mining exploration or related activities while the exclusion zone remains in place.

Figure 10: Planned Sequence of Mining

Geology of Dhupuma Plateau and Surrounding Area

The geology of the Gove Peninsula in the area where the bauxite deposits are developed comprises Palaeoproterozoic (ca 1870Ma) metasediments, mafic gneiss and intrusives of the Bradford Complex overlain by a 100-200m thick sequence of Lower Cretaceous sandstones and claystone of the Yirrkala Formation (Figure 11).

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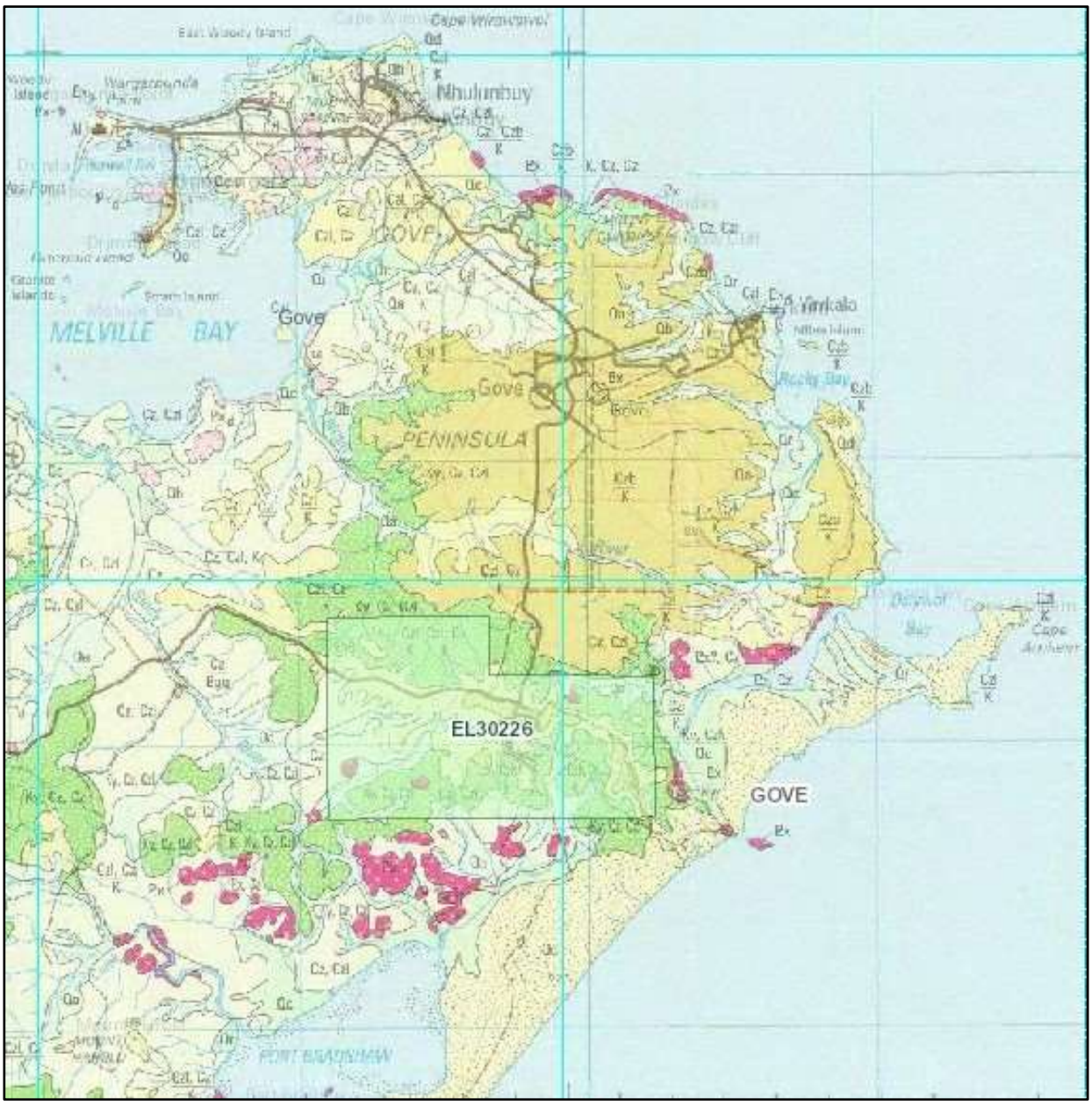
Figure 11: Regional Geology of Gove Peninsula and Dhupuma Plateau



Source: NTDME Strike

During the Tertiary period, the region underwent extensive lateritisation resulting in bauxite development such as that seen at Gove. Beneath the laterite profile at Gove, the Yirrkala Formation consists mainly of friable, kaolinised arkosic sandstone and quartz sandstone with minor claystone interbeds. While several occurrences of bauxite have been recorded in the east Arnhem area, further large economic deposits outside of the Gove mine site have not been discovered.

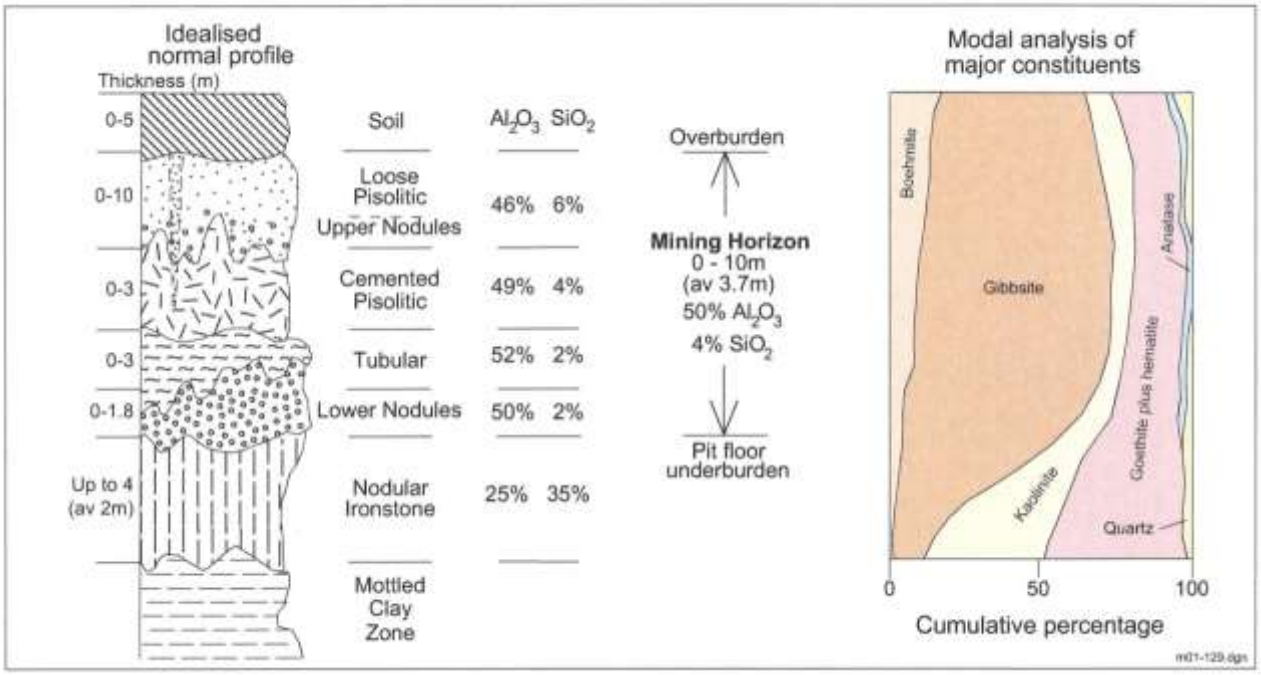
The main plateau hosting the Gove deposits is gently undulating and is typically 30-60m above sea level (ASL), significantly lower than the surface of the Dhupuma Plateau which ranges between 85-115m ASL. The thickness of the bauxite sheet in the Main Gove Plateau deposit reportedly averages about 3.7 m, and ranges from absent at plateau edges and on hill crests to 10 m thick in topographic swales. At Dhupuma Plateau the thickness of the bauxite horizon is reported by previous workers as ranging between 3- 11m thick.

The deposit type sought is lateritic bauxite derived from the weathering of aluminous sediments in a tropical to sub-tropical environment. Up to eight discrete layers are recognised in a complete bauxite laterite profile including from surface: topsoil; loose pisolitic bauxite; cemented pisolitic bauxite; tubular bauxite; lower nodular bauxite; nodular ironstone; mottled zone; and saprolite. Not all bauxite sections contain the full bauxite profile. See Figure 12.

In general, the bauxite mineralogy of the Gove deposits is composed of gibbsite and minor boehmite, particularly in the upper levels of the profile. Silica is present as free quartz and in kaolinite and haematite and goethite are the main iron oxide constituents.

The project area is covered by a regional scale aeromagnetic survey flown for the NTGS in 1990-92 (Rawlings et al., 1997). The radiometric data can be used to distinguish the laterite covered areas from those of both basement and Quaternary sand cover. Thorium is mostly immobile in chemical weathering environments, and as such the intensity of the Thorium channel relative to the Potassium and Uranium channels can be used as a first pass proxy to estimate the degree of in situ weathering over a given area.

Figure 12: Gove Area Bauxite profile



Source: Firenczi, 2001

Previous exploration open file data on EL30226 is limited. While anecdotal evidence suggests that the Dhupuma plateau area has been explored at some level for bauxite most previous work described was undertaken by the Northern Territory Government (the NT Geological Survey and the NT Mines Branch) as part of their regional geology and mineralisation programs between 1964 - 1997.

In 1964 seven RAB and two diamond holes were drilled upon the plateau. The drilling was undertaken to determine foundation conditions for satellite tracking antenna sites. The seven RAB holes are reported to have intersected weakly cemented pisolitic bauxite, ranging from 1.8-4.3m thick, underlain by tubular bauxite. One diamond hole (DDH3) is reported as intersecting at least 4.1m of tubular bauxite (Hickey 1987).

Firenczi (2001) reports some 55 water boreholes were drilled in the central portion of Dhupuma Plateau with various holes intersecting a bauxite layer that ranges between 3.5 – 11m in thickness.

4.1.4 Performance against Previous MMP

There has been no mining activity on ML31025. Mining and mining related activity will only take place after regulatory approvals have been completed.

4.2 Processing Activities

There will no processing of bauxite ore on ML31025, including no crushing, no screening, and no treatment of ore.

4.2.1 Residue/Tailings Storage Facility

There will be no residues and no tailings generated from the mining activity and therefore no storage facility on the proposed mining lease.

4.2.2 Process/Mine Water Dams

The mining operation does not require Process/Mine Water Dams or explosives

4.2.3 Processing Performance against Previous MMP

There is no previous mining or processing on the Dhupuma plateau and no processing is proposed. There is no previous MMP.

4.3 Exploration Activities, 2014 and 2015

An orientation field visit was completed in August 2014. Sampling and reconnaissance identified pisolitic bauxite horizons both on the plateau and in borrow pits off the plateau on the northern and western lowlands within EL30226. Exploration drilling was carried out in September 2014.

Existing tracks were used where possible. The centre line drill line (east west) was cleared using a D6 dozer with the blade kept off the ground and avoiding all trees greater than 10 cm diameter. The north and south running drill lines from the centre line were cleared using a small tractor to further limit environmental impacts and maximise natural regeneration of vegetation. A light weight tractor mounted air core drill rig was used for all drilling. Drilling intervals were 200 m between rows and 50 m spacing's between holes.

182 holes were drilled on EL30226, using a vacuum-lift rig with a 2- inch diameter drill. Ground disturbance was minimal.

Costeans were not required, however, five narrow sample excavations to 1 m width and up to 4 m depth were excavated and immediately re-filled after sampling. The total area of vegetation disturbed by drill lines is estimated to be approximately 2 ha.

Because the soil has been left with minimal disturbance, with root stock retained, there was no need for active intervention for rehabilitation and the area was left to regenerate naturally. Experience in this area and photographic evidence in March 2015 after the drilling in September 2014 indicates that the area has regenerated quickly after disturbance.

In November 2015 a second stage of drilling was undertaken on the Dhupuma Plateau project with a twofold objective namely resource confirmation and mine planning and to test potential extensions to the area of mineralisation identified in the previous year.

Drilling was carried out by MLM Drilling, using a vacuum-lift drill rig mounted on a Toyota 4WD (Plate 1). Shallow (1.0-5.0 m) 48mm diameter holes were drilled vertically in order to intersect mineralisation at an approximate 90 degree angle. Vacuum drilling was selected due to its proven performance in laterite terranes. It is a cost effective drilling method that produces good sample recoveries and accurate interval depths.

The vacuum drilling method involves drilling each individual interval to the target depth with the sample sucked out of the hole through the inside of the drill string and deposited in a vacuum flask in clear sight of the driller. At the end of each interval, the driller stops drilling and turns off the vacuum system so the interval sample can be recovered from the vacuum flask before continuing to drill the next interval. Plate 1 indicates the small scale equipment used to conduct drilling activities.

Plate 1: Dhupuma Plateau 2015 Drilling Program – MLM drill rig

Drilling was undertaken on grids established using the existing 2014 drilling program east west baselines and access tracks across the plateau. A handheld GPS (+/- 2.5m accuracy) was used to survey in the drill lines and hole locations, which were flagged. The drill lines were subsequently cleared using a Front End Loader (FEL). Clearing of drill lines did not include removal of root-stock, so that natural revegetation could occur rapidly.

Drill holes were planned on:

- 50m spaced drill lines at 50m spacings along the lines in the North-West and Central Areas where infill drilling was undertaken for resource confirmation and mine planning; and
- 200m spaced drill lines at a nominal 100m spacing along the lines in the Northern, Eastern and South-West Areas where extensional drilling was undertaken to test potential extensions to mineralisation.

This drill hole spacing was deemed sufficient to establish the degree of geological and grade continuity appropriate for a Measured and Indicated resource estimate and Inferred resource estimate respectively.

The drilling program comprised a total of 226 drill holes (including twin holes).

The following exploration activities were undertaken in November 2015:

- Implementation of the second phase of drilling at Dhupuma Plateau, comprising:
    - 100 m x 50 m spaced infill drilling of the current area of interest and
    - 200 m x 50 m drilling of the new target areas identified from the reconnaissance exploration

The same low impact access methods were used to minimise impact on soils, root-stock and surrounding vegetation. This includes the use of a tractor-mounted vacuum-lift drill rig with 2” diameter holes.

Low impact drilling and clearing can be clearly seen in Plates 2-6. Plates 2 and 4 illustrate how larger trees were avoided and root stock was left un-damaged, due to the use of low impact machinery and careful navigation through woodland. Plates 3, 5 and 6 illustrate the effectiveness of this access method five months after drilling.

Additional examples of low impact drilling and recovery from drilling activity is also provided in Section 8.2 (Background information in ‘Costing of Closure Activities”).

Plate 2: Clearing for drilling with minimal disturbance, April 2015 on EL30226

Plate 3: 21 April 2015, Regeneration of disturbed vegetation 21 April 2015 after Sept 2014 drilling on EL30226

Plate 4: Clearing for drilling with minimal disturbance, April 2015 on EL30226

Plate 5: Regeneration – disturbed vegetation 21 April 2015 after Sept 2014 drilling

Plate 6: Regeneration – disturbed vegetation 21 April 2015 after Sept 2014 drilling

Table 4 below provides a summary of on-site environmental management performance for the drilling activity in 2014 and 2015

Table 4: Drilling Performance Summary Dhupuma Plateau 2015

Drilling activities	Performance requirements	Actions to ensure performance	By whom	By when	Outcomes
Pre-exploration Activities					
Ecological, heritage, sacred site avoidance survey	Complete 2015 dry season Surveys	Complete mapping of vegetation; species list, avoidance survey of heritage, sacred sites	Ecologist; Traditional Owners with support from heritage specialist	Nov 2015	Performance target met Surveys complete
Ecological surveys	Complete 2015 dry season Surveys	Complete survey during dry season 2015	Ecologist	Nov 2015	Performance target met Surveys complete
Confirm drilling contractor roles, Environment commitment requirements	Meet with contractor and outline induction process	Complete induction process as outlined in induction plan	Geologist	Nov 2015	Performance target met Completed
Establish base within fenced compound previously used by Gumatj for sawmilling	No activity to take place outside the Exploration lease except within fenced compound previously used by Gumatj for sawmilling	Set up fuel stores, parking space; equipment storage; minimise impact on sawmill operations	Contractor; with Gumatj support	Nov 2015	Performance target met Completed
Photo record of areas to be disturbed	Nil	Take photos of areas yet to be disturbed to establish photo-record for baseline	Contractor	Nov 2015	Performance target met Completed
Conduct pre-site work training	Nil	Implement site-based training for Indigenous trainees	Gumatj	Nov 2015	Performance target met Completed
Activities during Drilling Operations – MMP Compliance					
establish drill lines	Complete training plan, including evaluation of clearing extent	Take before and after photos; complete training for Indigenous trainees	Gumatj	Pre- and during drilling Nov 2015	Performance target met Low impact operations
Heritage and sacred site Protection	Report discovery of any heritage places or objects that have not been previously identified	Ensure any items of places of cultural value, not previously identified are not disturbed and reported	Drilling Team (report to Gumatj)	During drilling and other activities	Performance target met No heritage sites or sacred sites found
Use of Machinery containing fuels, lubricants	Monitor, report all spills or incidents, regardless of volume	Monitor, report on incidents	Drilling Team	During drilling and other activities	Performance target met No spills
Daily work with sample bags, lunch wrappers etc.	Mitigate impact of spills, Minimise litter	Maintain records of spills and actions taken to mitigate impacts, Remove litter at least daily	Drilling Team	During drilling and other activities	Performance target met No litter or other waste remaining on Site

Drilling activities	Performance requirements	Actions to ensure performance	By whom	By when	Outcomes
Post Exploration Activity – MMP Compliance					
Final litter check	Ensure no litter remaining	Remove any remaining littler	Drilling Team	After drilling	Performance target met
Plug all holes	Ensure all holes are plugged as holes are cleared to be closed	Record and report on unplugged holes to Landroc	Drilling Team	Following completion of drilling	Performance target met with modification of original technique All holes plugged (Note: Methodology changed to manual backfill of each hole, rather than using plugs)
Report on fauna impacts of drill holes	Investigate drill holes to determine fauna losses	Record and report to Gumatj	Drilling Team	Following completion of drilling	Performance target met No observed injured or dead fauna
Remove all materials and equipment	Remove all items brought onto the site	Record and report to Gumatj	Drilling Team	Following completion of drilling	Performance target met All materials removed
Confirm that clearing has been minimised	Minimise clearing beyond MMP commitment	Record using photos and report to Gumatj	Drilling Team	Following completion of drilling	Performance target met Scraping off small shrubs, root stock preserved
Monitor new weed infestations and any new introductions	Minimise new weed incursions and any increases to baseline	Record using photos, GPS and report to Gumatj	Gumatj	Following completion of drilling	Performance target met No weed incursions identified
Monitor any new pest fauna introductions	Minimise new fauna pest incursions and any increases to baseline	Record using photos, GPS and report to Gumatj	Gumatj	Following completion of drilling	Performance target met No pests
Control access to drill sites to minimise further disturbance	Minimise accessibility of site to passing traffic	Disguise entry/exit points	Gumatj	Following completion of drilling	Performance target met All entry points disguised
Complete site inspection to determine overall environmental management	Minimise footprint of disturbance	Report to Gumatj	Drilling team; Gumatj	Following completion of drilling	Performance target met Very low impact and excellent early recovery by plants
Rehabilitate areas disturbed by drilling and related activities	Rehabilitate site where disturbance has occurred	Monitor for 6-12 months to confirm effective rehabilitation	Gumatj	Following completion of drilling	Performance target met Disturbance level low and recovery in progress
Obtain results of drilling programme and report internally on outcomes	Report on drilling outcomes to regulator as required	Report to DME (if and when required)	Gumatj	Following completion of drilling	Performance target met Drilling results outlined in this MMP

5 ENVIRONMENTAL MANAGEMENT

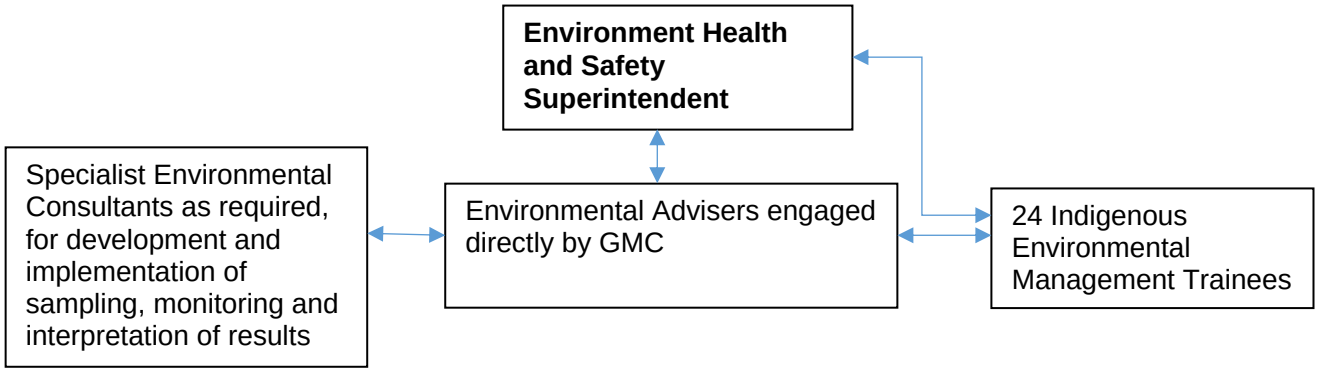
5.1 Environmental Management Structure

Mining operations will be small scale. The EHS Superintendent will be responsible for EHS performance on site. Environmental consultants will provide specialist services as required.

GMC is 100% owned by Gumatj Corporation. Gumatj's Environmental Health and Safety Policy is provided on the following page.

5.2 Environmental Health and Safety Policy

Figure 13: Environmental Management Structure



Environment Health and Safety Policy

Gumatj Corporation Ltd (and Subsidiaries)

Environment Health and Safety Policy

Gumatj Corporation will:

Wherever possible, minimise, or otherwise minimise, mitigate and remediate, harmful effects of the company's operations on the environment, our employees, our contractors and the community

Ensure that employees and contractors are inducted and trained to a level that is appropriate for their role

Comply with all relevant Environmental, Health and Safety laws and regulations.

Implement environmental protection measures that address pollution prevention

Engage with and support the communities where we operate

Signed

Klaus Helms
Chief Executive Officer
Gumatj Corporation

Date: August 2016

5.3 Environmental Commitments

5.3.1 Commitments Contained in the MMP

A list of performance objectives, developed via the aspects and impacts risk assessment process in Section 5.6.2 is provided in Table 5.

Table 5: Environmental Commitments

Assessed risk	Performance objective	Location of document
Water Management	Surface water run-off is directed to settlement basins to minimise sediment load. Identified sources of contaminants from operational activities will be managed in accordance with national standards. Run-off water quality sampling to identify contaminant sources, and to initiate response. Monthly groundwater sampling to monitor change within key parameters approach or exceed trigger levels.	Section 5.6.2
Soil and Land Management	Retain soil resources for post-mining rehabilitation and; maximise survival of mycorrhiza; seeds and other propagules.	Section 5.6.2
Native Flora and Fauna	Minimise loss of flora and fauna as a result of clearing; maximise recovery through rehabilitation.	Section 5.6.2
Animal Pests and Weeds	Minimise the risk of animal pest species becoming established in the area as a result of clearing and other mining-related activities.	Section 5.6.2
Air Quality	Dust and exhaust fumes will be managed to minimise discomfort or impact on health for workers, Mining Training Centre trainees or users of local roads.	Section 5.6.2
Noise and Vibration	Noise and vibration will be managed to minimise discomfort or impact on health for workers and Mining Training Centre trainees.	Section 5.6.2
Energy Management	All equipment on-site that requires hydrocarbon fuels to operate, will be maintained and operated in accordance with the manufacturer's specifications and not left idling for extended periods when machines are not required.	Section 5.6.2
Waste Management	Waste generated on site to be segregated as far as possible, on site, then either recycled or disposed at the Nhulunbuy Corporation Waste Disposal Facility in accordance with the Corporation's standard.	Section 5.6.2
Hazardous Chemicals, Wastes and Dangerous Goods	Minimise discharge of potential pollutants to water, vegetation, air or soils as a result of mining-related activities within the lease area and in transit by road.	Section 5.6.2
Natural Disasters (fire, Cyclones)	Minimise harm to personnel and rehabilitation areas in the event of a fire or cyclone.	Section 5.6.2
Waste Rock	No waste rock will be generated from the mining operations.	Section 5.6.2
Erosion Management	Cleared areas will be managed to minimise accelerated erosion. This will include directing run-off to retention basins where infiltration rates are low. Significant erosion events on site will be monitored and rectified as soon as rainfall conditions abate.	Section 5.6.2
Cultural Heritage	Local Cultural Heritage on the lease to be recorded; Traditional Owners to undertake cultural heritage surveys with experienced cultural heritage consultants.	Section 5.6.2
Use of Natural Resources	Reasonable efforts will be taken to minimise water use and spillage, maximise recovery of bauxite resources, minimise fuel use and minimise clearing of vegetation that would otherwise remain alive in the forest or used for production of timber products.	Section 5.6.2

5.3.2 Recommendations Resulting from Formal Environmental Assessment

GMC submitted its Notice of Intent (NOI) to the NT Department of the Environment on 21 July 2016.

Additional requirements arising from DME assessment of this MMP and the NOI will be addressed as soon as any matters are provided by the relevant regulatory agencies.

It is expected that there will not need to be a formal environmental assessment for this project, due to:

- the surface-to-shallow depth of mineral extraction;
- no treatment of ore,
- no tailings
- no listed species or habitat present,
- small scale of the proposed mining and
- history of ELDO previous clearing on the Dhupuma Plateau the site.

Objectives, targets and mitigations are incorporated into the Risk Assessment and mitigations table in Section 5.6.2.

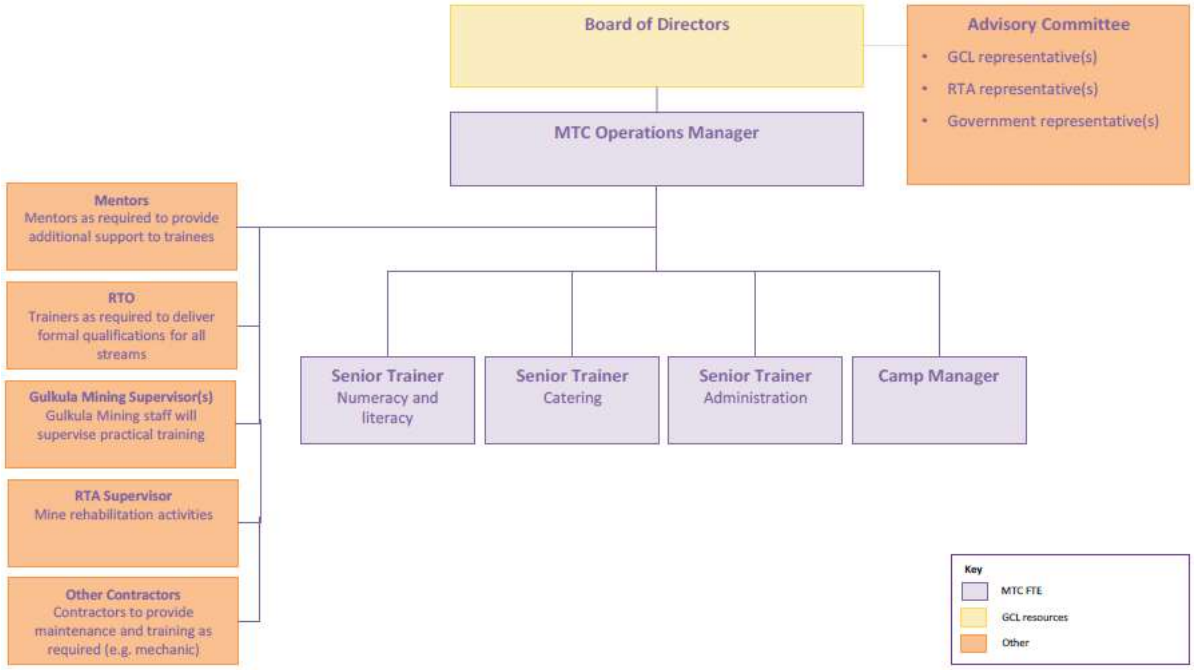
5.4 Environmental Training and Education

With broad financial support from the Commonwealth Government, the Northern Territory Government and Rio Tinto the Gumatj Corporation Pty Ltd is developing a comprehensive MTC.

Much of the infrastructure for the MTC has already been established, including a state-of- the art learning venue (the Knowledge Centre) built in 2013/2014 on the Garma Festival site. Rio Tinto will support the MTC by providing technical support for training in rehabilitation services at the Rio Tinto mine site.

The MTC training programme is now in development phase, to enable implementation in early 2017. The MTC governance structure is shown in Figure 14. The organisational structure, curriculum and related activities are outlined further below.

Figure 14: MTC Organisational Structure



The primary responsibility of the Registered Training Organisation's (RTO's) will be to deliver the units of training to attain the necessary qualifications for each stream as required.

During the early stages of establishment of the MTC, outsourcing the delivery of qualifications to Rio Tinto has been deemed most practical. Once the MTC is fully operational, the business model will be reviewed and the MTC may choose to investigate the possibility of becoming an RTO.

The selected RTO must have the following characteristics;

- deliver qualifications that map to the Australian qualifications framework;
- operate in remote region and urban communities nationally;
- support the education and training needs of Indigenous Australians;
- undertake assessments only to provide qualifications in isolation training;
- demonstrate flexibility in program delivery including the delivery of single units of competency and skill sets;
- collaborate with key stakeholders to ensure training is suitable and meet the needs of trainees and employers and;
- be approved to provide contracted employment services through the Remote Jobs and Communities Program (RJCP).

GMC supervisors will be employees at the mine. The employees will have the necessary qualifications and experience to provide instruction and supervision to trainees for mining activities including machinery operation.

The supervisor(s) will be required to assist trainees to record their machine hours in the logbook to provide evidence of experience. Outside of practical training hours, the supervisor will undertake mining activities to support the operation of the mine.

Rio Tinto supervisor(s) will be part of the environmental team at Rio Tinto, responsible for rehabilitation of mined areas or subcontractors managed by Rio Tinto to undertake rehabilitation activities. The supervisor(s) will provide instruction and supervision to trainees for mine rehabilitation activities. Outside of practical training hours, the supervisor(s) will undertake rehabilitation activities as part of the Rio Tinto rehabilitation programme.

Courses will cover the following training and induction requirements:

- Fitness for work, including health and drug and alcohol checks
- Introduction to work space and training sites, including cleaning information, environmental tour, breathalyser and toolbox explanation
- Name writing and signatures
- Team building activities and games
- General Induction – Rio Tinto
- Summary of Mining Management Plan
- Regulatory Requirements associated with mining operations
- Awareness of management requirements to minimise impact on flora and fauna, sacred sites, archaeological sites, cultural heritage, invasive plants and animal pests (e.g. yellow Crazy ants)
- Targeted training on environmental monitoring and management for trainees who wish to develop these skills.

OHS Training will include, but will not be limited to:

- Workplace Health and Safety
- First Aid training
- Manual handling
- Hazardous substances handling, storage and transport (wastes, flammables).

Practical skills training will include, but will not be limited to:

- Construction White Card Training
- Mine Visit
- Simulator training e.g. mobile equipment
- Vehicle pre-start and costs associated with running a vehicle.

Trainees with an interest in rehabilitation management will attend courses covering the following topics:

- Procedures and key steps in mine rehabilitation, such as nursery techniques, soil handling, mine floor preparation, seed bed preparation, timing and methodology of sowing seed
- Environmental Emergency Response Training
- Safety procedures
- Mine rehabilitation data collection and monitoring
- Mine rehabilitation management requirements such as fire control, pest and weed Management

Other training will include:

- Planning and organising work
- Working safely and following occupational health and safety policies and practices
- Plant and equipment maintenance
- Reading and interpreting plans and specification
- Basic computer skills
- Health, fitness and hygiene
- Nutrition
- First aid
- Maintaining up-to-date training records
- Work placement.

For more information on training and inductions.

5.5 Environmental Emergency Preparedness and Response

The GMC Emergency Preparedness and Response Plan have been developed for the project. The Environmental Management Manual (EMM) will provide a consistent framework for all procedures on site.

The DME will be provided with all relevant documents prior to commencement of mining and related activities. The Risk Assessment/Risk Management Table (Section 5.6.2) provides the basis for the Preparedness Response Plan. Key elements of the Emergency Preparedness and Response Plans are outlined below:

5.5.1 Cyclone Emergency Preparedness and Response Plan

Tropical cyclones in the Northern Territory mostly form from lows within the monsoon trough, between November and April. The north-western Gulf of Carpentaria has the highest concentration of cyclone days with an average of two cyclones per year (BoM 2016). These natural events can cause extensive damage, with secondary impacts such as fire risk in the dry season from increased fuel load when trees and their branches are brought to ground.

Specific measures to reduce the impact of cyclonic impacts will include:

- Ensure all personnel are trained to the level required for their role in emergency response
- Secure all equipment that contain substances which would cause pollution if released

- Ensure all other on-site equipment is tied down or returned to Nhulunbuy for storage
- Prepare early to ensure flooding and erosion impacts are minimised
- Maintain regular communications with local emergency services as cyclone approaches
- Prioritise post-cyclone actions, including damage assessment, re-establishing communications, clearing access roads, rehabilitation recovery plan. Site Management will act in accordance with instructions from Gove Emergency Services, in all cases.

5.5.2 Fire Emergency Preparedness and Response Plan

- Removal of excess fuel load to achieve effective firebreaks around all operations areas at the beginning of the dry season
- Establish and maintain on-site fire-fighting equipment
- Reinforce induction and training messages regarding mustering
- Call in support from Bushfires NT, local emergency services from Nhulunbuy and/or airport as required
- Ensure all access roads and haul road are wide enough at all times, to allow for personnel to exit the site immediately
- Ensure all fuel stores and equipment containing flammables are stowed in clear areas
- Refer to North Australian Fire (NAFI) Information (NFI)

Weed Emergency Preparedness and Response Plan

- Establish weed wash-down bays for all vehicles entering and exiting the site
- Initiate a weed monitoring plan across all areas that can be accessed by road or tracks
- In the event of a weed incursion, quarantine the affected area and eradicate the incursion

5.5.3 Animal Pest Emergency Preparedness and Response Plan

- Establish a monitoring programme to measure the impact of pest fauna, including water buffalo and crocodiles
- Minimise the amount of open water on site to discourage entry of feral animals to site
- Seek support from emergency services where appropriate, to remove feral animals from site

5.5.4 Emergency Preparedness and Response Plan – Fuels and Chemicals

- Regularly monitor (daily and/or weekly) all storage tanks and small containers on site to detect leaks and spills
- In the event of a spill, isolate the area, remove contaminated soil and dispose of waste and a licensed facility. For more details, see Section 9.3

5.6 Implementation, Monitoring and Review

5.6.1 Identification of Environmental Aspects and Impacts

Aspects and impacts for this project have been identified and risk rankings determined. The risk assessment table incorporates performance targets, to consolidate and draw a direct connection between inputs and intended outcomes.

The frequency of assessment will be defined prior to commencement of mining and related activities.

5.6.2 Risk Assessment

This section outlines the risk assessment undertaken for the project.

Water Management

Objective: Minimise risk to water quality and impacts of water flows.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Redirection of natural water flow	Erosion, gullying – damaging downstream habitat	Map pre-existing water flow; design new temporary drainage to manage surface water	**Low** Consequences (2) Likelihood (2)	Sediment will be directed to on-site settling basins to minimise settlement load	Short term effect as water management measures and rehabilitation of vegetation will stabilise soils after mining
	Potential contaminants in stormwater due to contact with spills outside of containment systems	Run-off water quality sampling to identify any possible contaminant sources, and to initiate response.	**Low** Consequences (2) Likelihood (2)	Run-off water quality sampling to identify any possible contaminant sources, and to initiate response.	Fuel storage and other chemicals on site may be released if not adequately contained and separated from rainwater run-off
	Depriving downstream habitats that are reliant on historical water flows	Conduct Pre-mining assessment of surface water, groundwater and downstream habitats. Where required, install drainage pathways that maintain water flows equivalent to pre-disturbance flows. Install buffer areas for identified sensitive habitats	**Low** Consequences (2) Likelihood (2)	Natural water flow rates to downstream habitats maintained	Pre mining assessment will confirm pre-disturbance water flow. The mine footprint does not contain any creek systems, riparian areas or other water bodies
	Creation of wetter habitats favourable to weeds, leading to invasion of habitat	Minimise weed incursions by periodically monitoring sites with potential to occupy wetter areas; wash-down procedure in place	**Low** Consequences (2) Likelihood (2)	Minimise risk of weed species being established in areas disturbed by operations	Weed management plan with detailed procedures including wash down facilities will be installed and managed to minimise incursion of weeds not previously in the area

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Surface water comes into contact with contaminants	Surface water quality degraded as a result of fuel spills and hydraulic oil spillages	Potential contaminants such as hydrocarbons managed to reduce spills, mitigation measures in place to contain any incidents and procedures to minimise contamination from accidental spills. Complete surface water quality monitoring of the site, prior to mining activity.	**Low** Consequences (2) Likelihood (2)	Periodic Monitoring indicates that surface water quality remains within national standards	Potential contaminants managed by specific management plans, e.g. hydrocarbon management plan
	Surface water quality degraded as a result of pre-existing contamination	Isolate any pre-existing contamination from uncontaminated surface waters	**Low** Consequences (2) Likelihood (2)	Monitoring indicates that any contaminated surface water is isolated, and where necessary, treated	No known contaminants exist on site
Groundwater comes into contact with contaminants	Groundwater quality degraded as a result of fuel spills and hydraulic oil spillages.	Potential contaminants managed by specific management plans, e.g. hydrocarbon management plan Complete groundwater quality monitoring of the site, prior to mining activity	**Low** Consequences (2) Likelihood (2)	Periodic Monitoring indicates that groundwater quality remains within national standards.	Potential contaminants managed by specific management plans, e.g. hydrocarbon management plan Pre-mining groundwater sampling will establish a baseline for groundwater quality.
	Groundwater quality degraded as a result of pre-existing contamination.	Isolate any pre-existing contamination from uncontaminated ground waters	**Low** Consequences (2) Likelihood (2)	Monitoring indicates that any contaminated groundwater is effectively isolated, and where necessary, treated	Pre-existing ground water quality will be established as part of initial and ongoing water quality monitoring program. No known contaminants exist on site

Soil and Land Management

Objective: Retain soil resources for post-mining rehabilitation; maximise survival of mycorrhiza; seeds; other propagules.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Soil resources and propagules not adequately stored and managed to facilitate rehabilitation	Reduced quality of rehabilitation due to low levels of germination from stored soil	Implement a Rehabilitation Procedure to ensure soil is spread on mined land as soon as next wet season rains begin	**Moderate** Consequences (3) Likelihood (3)	Available soil collected and stockpiled to be used for rehabilitation prior to following next wet season rains begin	Some areas to be mined have very little, or no top soil due to previous land clearing for ELDO site and cemented surface bauxite without soil cover. Additional mitigation measures include planting seed and seedlings
Topographic features within the lease area not adequately preserved	Areas within the plateau will be modified and in some cases, landforms modified by reducing the landscape the depth of the bauxite	Implement procedure to ensure is a 20m buffer to protect 'breakaways' on the edge of plateaus	**Low** Consequences (2) Likelihood (2)	Maps to indicate 20m buffer for 'breakaway' areas and procedures in place to ensure these areas are protected by 20m buffers	20m buffers will be established along the edges of the plateau

Native Flora and Fauna

Objective: Minimise clearing to reduce potential impact on flora and fauna as a result of clearing

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Flora in contact with land clearing and mining activities	Reduced populations of flora in the mining area, in the short term	Detailed site survey prior to each area being cleared, to confirm species are present	**Low** Consequences (2) Likelihood (2)	Minimise cleared area for each mine pit and maximise flora and fauna recovery through rehabilitation	Wet season and dry season surveys have been conducted no listed species identified
Fauna in contact with land clearing and mining activities	Reduced populations of fauna in the mining area, in the short term	Detailed site survey prior to each area being cleared, to confirm whether or not listed species are present	**Low** Consequences (2) Likelihood (2)	Minimise area cleared for each mine pit	West season and dry season surveys have been conducted with no listed species identified

Animal Pests and Weeds

Objective: Minimise risk of animal pest species and weeds becoming established in the area as a result of clearing and other mining related activities

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Introduction of weed species into the operational area and surrounds	If introduced to a disturbed area, weeds are likely to spread and displace natural habitat	Implement weed hygiene measures including wash-down of equipment in dedicated washing areas	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of weed incursions as a result of clearing and other mining-related activities	Weed species occur in various areas in the Gove Region, particularly where past disturbance has occurred however no weed species were identified on site during flora surveys
	Some weeds may have an effect of increasing fire risk – e.g. tall grasses that create increased dry fuel	Implement regular monitoring to detect weed incursions	**Moderate** Consequences (3) Likelihood (3)	Introduced plants and their propagules will be removed as soon as they are detected	Weed species can be eradicated with vigilant monitoring. The weed management Plan includes minimising incursions and eradication techniques
		If monitoring indicates weed presence, they will be reported, removed, and increased monitoring implemented	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of weed incursions as a result of clearing and mining related activity	The Mining Training Centre will have a strong focus on environmental management
Introduction of animal species into the operational area and surrounds	Animal pests introduced to disturbed areas modify habitat so that local species are displaced	The pest and weed Management Plan will be implemented to minimise establishment of invasive animal pests Specific mitigations include trapping, baiting and physical removal. Monitoring of potential pest threats will begin with baseline surveys, followed by ongoing monitoring and management, depending on the type of pest.	**Moderate** Consequences (3) Likelihood (3)	No long term establishment of invasive animal pests	Active on-ground learning about Minimisation and management of pests will be a key part of the Mining Training Centre curriculum. Therefore, the monitoring and management of pests will be well resourced. Local specialists will monitor and control crazy ants, consistent with current control methods adopted in the Gove Region.

Air Quality

Objective: Dust and exhaust fumes will be managed to minimise potential of impact on health for workers, Mining Training Centre trainees or users of local roads.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Clearing and other mining-related activities create dust	Dust emissions may cause some stress to flora	Water trucks will be used to reduce dust emissions that might otherwise settle on vegetation	**Low** Consequences (2) Likelihood (2)	Ongoing vegetation monitoring shows no significant dust impacts	The area cleared on site at any one time will generally be less than y 40-ha.
	Dust emissions may reduce workers visibility on haul roads and public roads	Water trucks will be used to minimise dust on haul roads and public roads used by the mining operation	**Low** Consequences (2) Likelihood (2)	No accidents of near misses as a result of dust impacted visibility	Operations will shut down if poor visibility due to dust in high wind conditions
Vehicle and generator exhausts will emit volatile fumes and particulates	Vehicle and generator exhausts may cause discomfort to workers if they are exposed to emissions for long periods	Vehicle and generator exhausts will be managed in accordance with manufacturer's specifications	**Low** Consequences (2) Likelihood (2)	No discomfort or health impacts as a result of exposure to exhaust emissions on site	Stationary equipment emitting exhaust fumes will not be placed close to work areas where workers may be exposed
		Generators will not be placed where workers may be exposed for long periods	**Low** Consequences (2) Likelihood (2)	No discomfort or health impacts as a result of exposure to exhaust emissions on site	Stationary equipment emitting exhaust fumes will not be placed close to work areas where workers may be exposed
		Inductions, signage, training and Daily Toolbox meetings will be standard practice for all employees. The daily meetings will cover all EHS requirements	**Low** Consequences (2) Likelihood (2)		

Noise and Vibration

Objective: Noise and vibration will be managed to minimise potential of discomfort or impact on health for workers and Training Centre trainees.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
On-site mobile and stationary equipment can cause vibration and noise impacts	Noise and vibration can cause fright to animals. If startled, they may be harmed by being hit by vehicles	Equipment will be operated in compliance with manufacturer's requirements; Stationary equipment will be in areas where on-site personnel are not usually present	**Low** Consequences (1) Likelihood (3)	Operators of mobile equipment will adhere to strict speed limits on site and noise suppression equipment applied where standards require it	The mining area location is remote from any living areas
Employees and trainees may experience discomfort if exposed to noise and vibration for long periods		Inductions and Daily Toolbox meetings will be standard practice for all employees. The daily meetings will cover all EHS requirements	**Low** Consequences (2) Likelihood (2)	Minimise discomfort or health impacts on workers as a result of exposure to noise and vibration on site	Impacts of vibration and noise will be restricted to the operating area

Energy Management

Objective: Equipment on-site that requires hydrocarbon fuels to operate, will be maintained and operated in accordance with the manufacturer's specifications and not left idling for extended periods when machines are not required.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Inefficient use of energy will increase carbon emissions to the atmosphere	Carbon emissions to the atmosphere increases risks associated with global climate change	All equipment using hydrocarbon fuels will be maintained and operated in accordance with the manufacturer's requirements and not left idling for extended periods when equipment is not required	**Low** Consequences (1) Likelihood (2)	Equipment operated to manufacturer's specifications; equipment will be shut down when not in use	GMC will utilise fuel efficient equipment and investigate alternative fuels, within manufacture's specifications

Waste Management

Objective: Waste generated on site to be segregated as far as possible, on site, then either recycled or disposed at the Nhulunbuy Corporation Waste Disposal Facility in accordance with the Corporation's standards.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Waste generated on site may cause harm to people, flora and fauna	Waste can cause poisoning to fauna, contaminate soils and groundwater and present hazards to onsite personnel	Waste will be segregated as far as practicable, on –site and either recycled or disposed or at the Nhulunbuy Corporation Waste Disposal Facility in accordance with the Corporation's standards	**Low** Consequences (2) Likelihood (2)	No waste disposal of any kind on site. All waste transported directly to the Nhulunbuy Corporation Waste Management Facility.	Many activities on site will generate wastes. Receptacles will be established for all waste for disposal at the licensed Nhulunbuy Corporation Waste Management Facility

Hazardous Chemicals, Wastes and Dangerous Goods

Objective: Minimise potential discharge of potential pollutants to water, vegetation, air or soils as a result of mining-related activities within the lease area and in transit by road.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Flammable liquids handling.	Flammable liquids could injure or cause injury to on-site personnel if the liquids are not handled in accordance with manufacturers' instructions and Material Safety Data Sheets (MSDS)	Maximise use of less flammable materials, including diesel vehicles and generators wherever possible. Minimise use of high flammable liquids such as petrol and other volatile liquids. Ensure all on –site personnel are inducted and aware of their responsibilities to safety handle the materials.	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of incidents resulting in harm to people or environment via handling	Staff and trainees will complete inductions and training that will including sufficient understanding of hazardous substances and regulations. All spillages will be recovered and/or removed to appropriate waste disposal facilities
Flammable liquids storage	Flammable liquids could cause injury or health impacts to on-site workers if the liquids are not stored in accordance with Govt Hazardous Chemicals and Dangerous Goods Regulations and MSDS	Store all Hazardous Chemicals and Dangerous Goods in approved enclosures and segregated from other hazardous materials in accordance with Govt Hazardous Chemicals and Dangerous Goods Regulations	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of incidents resulting in harm to people or environment from storage of flammable liquids	Staff and trainees will complete inductions and training that will including sufficient understanding of hazardous substances and regulations. Spillages will be recovered and/or removed to appropriate waste disposal facilities
Flammable liquids transport	Flammable liquids could cause injury or health impacts to off-site workers and off-site motorists if the liquids are not transported in accordance with NT Govt Hazardous Chemicals and Dangerous Goods Regulations, including signage and warnings	Transport all Chemicals and Dangerous Goods in approved containers/tanks in accordance with NT Government's Hazardous Chemicals and Dangerous Goods Regulations. Daily Toolbox meetings will include reminders of induction and training in relation to Hazardous Chemicals and Dangerous Goods, including, speed limits and awareness of road hazards	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of incidents resulting in harm to people or environment from transport of flammable liquids	Staff and trainees will complete inductions and training that will including sufficient understanding of hazardous substances and regulations as well as road hazards and speed limits All spillages will be recovered and/or removed to appropriate waste disposal facilities.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Fuel Storage tanks	Storage tanks may corrode, crack and/or be damaged by mine site machinery (e.g. dozer, loader, truck)	Fuel storage tanks will be bunded in accordance with the Australian standard for containment of spills	**Moderate** Consequences (3) Likelihood (3)	Minimise risk of harm to people or environment from storage of flammable liquids in tanks	Staff and trainees will complete inductions and training that will including sufficient understanding of the impact of leaks and over-filling. All staff and employees will be reminded through daily toolbox meetings.
		Fuel storage tanks will be tested periodically for leaks in accordance with oil industry standards	**Moderate** Consequences (4) Likelihood (2)	Minimise risk of incidents resulting in harm to people or environment from storage of flammable liquids in tanks	Staff and trainees will complete inductions and training that will including sufficient understanding of the impact of leaks and over-filling. All staff and employees will be reminded through daily toolbox meetings.
		Fuel storage tanks will have quick-break fuel hoses to shut off fuel flow and minimise spills	**Moderate** Consequences (4) Likelihood (2)	Minimise risk of incidents resulting in harm to people or environment from fuel storage tanks containing flammable liquids.	All staff and trainees will complete inductions and training that will including sufficient understanding of the impact of leaks and over-filling. All staff and employees will be reminded through daily toolbox meetings.
		As part of the surface and groundwater monitoring programme, tanks that are mounted on concrete, groundwater monitoring will be installed for early detection of leaks	**Moderate** Consequences (4) Likelihood (2)	Minimise incidents resulting in harm to people or environment from fuel storage tanks containing flammable liquids.	Staff and trainees will complete inductions and training that will including sufficient understanding of the impact of leaks and over-filling. All staff and employees will be reminded through daily toolbox meetings.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Compressed gases	Compressed gases on-site may, if not managed, could cause damage to infrastructure or injure anyone on site	All compressed gases will be secured in accordance with national standards. Only approved personnel with appropriate authority will be permitted to handle bottles or tanks that contain high pressure gases	**low** Consequences (3) Likelihood (2)	Minimise incidents resulting in harm to people from escape of high pressure gas from compressed gas cylinders	Staff and trainees will complete inductions and training that will including sufficient understanding of the potential for high pressure cylinders to harm people.
Hazardous wastes may come in contact with fauna, the environment or people	People and the environment may be physically harmed, exposed to corrosive substances, by hazardous substances such as lead acid batteries, oils, degreasers, volatile substances	All hazardous wastes stored in dedicated storage areas on site for a limited period, before transport to the Nhulunbuy Corporation Waste Disposal Facility, in accordance with the Corporation's standards. All hazardous waste stored and transported in compliance with the NT Dangerous Goods Act	**low** Consequences (3) Likelihood (2)	Minimise incidents of people or fauna being harmed as a result of having contact with hazardous waste on site	Hazardous wastes will be stored in compliance with the Dangerous Goods Act and not kept on site, except to be segregated temporarily stored and then transported to the local licensed waste disposal facility

Natural Disasters (fire, cyclones)

Objective: Minimise the potential of harm to personnel and rehabilitation areas in the event of a fire or cyclone.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Deliberate, accidental or natural fires (e.g. lightning) on site	Fires can cause harm to people on site, destroy equipment, infrastructure and reduce success of rehabilitation	Maintain firebreaks and roads wide enough to allow personnel to exit quickly. Maintain firebreaks to minimise fires moving into rehabilitation areas. Seek support from local emergency services to help limit spread of fires.	**Moderate** Consequences (2) Likelihood (2)	Minimise injury or health impacts to personnel on site or in transit to and from site. Minimise loss of equipment that is essential for fire control. Minimise harm to soils, vegetation or water quality as a result of fire events	High fuel loads occur after cyclones to due fallen trees.
		Provide adequate water supply and water pressure on site to fight spot fires	**Low** Consequences (2) Likelihood (2)	Minimise damage to environment due to inadequate fire management and suppression.	
		All personnel to be trained in initial response and notification to supervisors	**Low** Consequences (2) Likelihood (2)	Workforce inducted and aware of fire threat to the environment.	
Cyclones bringing strong winds, flooding and damage to equipment	High winds and/or flooding may result in failure of containment of fuels and other potential contaminants falling fallen trees, poor visibility	Monitor advice from local emergency services. Secure all equipment that has the potential to cause spills of potential pollutants	**Moderate** Consequences (3) Likelihood (2)	Minimise risk of release of potential pollutants to soil, water, air or rehabilitation areas during cyclone events	

Erosion and Sedimentation

Objective: Minimise erosion or noticeable increase in sediment load moving into adjacent undisturbed land.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Soil erosion may result from clearing and other mining-related activity	Soil erosion can impact on water ways, riparian areas and smother downstream flora and disturb natural habitats for fauna	An erosion management plan will be initiated prior to ground disturbance, Surface water flows will be mapped and down-slope erosion potential evaluated. Sediment basins and diversion banks will be established where high flows are expected.	**Low** Consequences (2) Likelihood (2)	Overland flow from cleared areas to be designed to minimise off-site erosion. Sediment basins will be in place to minimise sediment load.	The bauxite profile is very porous. Water travels quickly through the surface. Slopes are very gradual in most areas of the lease

Cultural Heritage

Objective: All local Cultural Heritage on the lease to be recorded and Traditional Owners informed immediately.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Cultural heritage may be adversely affected by mining related activities	Although Cultural heritage surveys have been undertaken, it is possible that some cultural heritage may be discovered for the first time, during pre-ground disturbance assessment	Detailed heritage surveys will be conducted prior to any ground disturbance. Traditional Owners will be undertaking the cultural heritage assessments. Cultural heritage management measures will be agreed prior to ground disturbance	**Low** Consequences (2) Likelihood (2)	Minimise risk of disturbance of cultural heritage sites Traditional Owners will be undertaking the cultural heritage assessments. Cultural heritage management measures will be agreed prior to ground disturbance.	The Traditional Owners of the land are also the owners of the Mine Lease. Traditional Owners will be undertaking the cultural heritage assessments. Cultural heritage management measures will be agreed prior to ground disturbance

Use of Natural Resources

Objective: Minimise water use and spillage, maximise recovery of bauxite resources, minimise fuel use and minimise clearing of vegetation that would otherwise remain alive in the forest or used for production of timber products.

Aspect	Potential Effect	Mitigation Measures	Risk Ranking	Performance Target	Additional context
Wasteful use of natural resources reduces availability to current and future generations	Other users, now and in the future may find that natural resources become less available and more costly to acquire.	Employee inductions, training and tool box meetings will include reminders that natural resource use must be minimised.	**Low** Consequences (2) Likelihood (2)	Employees and trainees recorded as having attended inductions and training that includes a requirement to minimise use of natural resources.	Conservation of natural resources is an important concept that will be included in the induction and training processes.

5.6.3 Environmental Management Plans

In accordance with the application of the Risk Matrix in determining risk rankings, Environmental Risks above 'Low' will require an Environmental Management Plan. The Risk Assessment and Risk Management process adopted in Section 5.6.2 has determined that there are no risks above the Moderate ranking. The EMP's that include risks with Moderate risk rankings are:

- Soil and Land Management Plan
- Animal Pests and Weeds Management Plan
- Hazardous Chemicals, Wastes and Dangerous Goods Management Plan
- Natural Disasters (Fire and Cyclones) Management Plan
- Rehabilitation Management Plan

Risks with 'low' or lesser rankings will be managed similarly to Environmental Management plans but with slightly less monitoring frequencies, and a capability to respond quickly in the event of a higher risk eventuating.

The GMC EMM will be the principal tool for outlining all processes that direct Environmental Performance Management. The EMM will also be used to ensure review of the effectiveness of mitigation strategies and management of non-conformances.

This will include procedures for all matters requiring risk assessment, as outlined in Section 5.6.2 of this document. All personnel on site will be informed of the EMM requirements through induction and training.

Senior Management will conduct an annual review of environmental performance and ensure that performance improvements are made where required. The results of the review will be made available to all site personnel. All required improvements will be implemented through a prioritised action plan. Monthly reports on improvement progress will be provided to management.

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Soil and Land Management Plan

Soils and Land Management will require specific management and responses. The risks (without mitigation) have been ranked as moderate. For completeness and to reduce duplication in the document, mitigations have been included in the Risk Assessment Table for easy reference.

Objectives	**Performance Targets**	**Monitoring and Measurement**	**Mitigations**	**Review of effectiveness of Management and Mitigations strategies**
1. Retain soil resources for post-mining rehabilitation; maximise survival of mycorrhiza; seeds; other propagules, throughout the life of mine	All available soil collected and stockpiled to be used for rehabilitation prior to each wet season	Specific procedures will be developed, through the EMM and implemented, prior to operations commencing, to ensure all environmental monitoring and measurement are carried out consistently and to the standards set by the NT Government and Australian Standards.	The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies	1. Implement a Rehabilitation Procedure to ensure soil is spread on mined land as soon as next wet season rains begin. 2. Implement procedure to ensure is a 20m buffer to protect 'breakaways' on the edge of plateaus.
Maintain 20m buffer from the edge of the plateau where the edge is sharply defined and final contours after mining are complementary to un-mined areas, throughout mining operations	2. Maps to indicate 20m buffer for 'breakaway' areas and procedures in place to ensure these areas are protected by 20m buffers prior to mining operations.			The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies.

Animal Pests and Weeds Environmental Management Plan

Animal pests and weed management will require specific management and responses. The risks (without mitigation) have been ranked as moderate. For completeness and to reduce duplication in the document, mitigations have been included in the Risk Assessment Table for reference.

Objectives	Performance Targets	Monitoring and Measurement	Mitigations	Review of effectiveness of Management and Mitigations strategies
Minimise weed or animal pest species becoming established in the area as a result mining related activities	Minimise risk of becoming established within the operating area and immediately adjacent lands a result of mining and related activities. Any introduced plants and their propagules will be removed as soon as they are detected. No long term establishment of invasive animal pests.	Specific procedures will be developed, through the EMM and implemented, prior to operations commencing, to ensure all environmental monitoring and measurement are carried out consistently and to the standards set by the NT Government and Australian Standards. This will include monitoring, measurement and review of effectiveness, as pre procedures developed within the EMM.	1. Implement weed hygiene including wash-down of equipment in dedicated areas. 2 .Regular monitoring to detect weeds. 3.If monitoring indicates weed presence, they will be reported, removed, and increased monitoring implemented. 4. Trapping, baiting and physical removal. Monitoring of potential pest threats will begin with baseline surveys, ongoing monitoring and management, depending on the type of pest. African Crazy ants will be managed as per current Gove methods.	The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies

Hazardous Chemicals, Wastes and Dangerous Goods Environmental Management Plan

Hazardous chemicals, wastes and dangerous goods management will require specific management and responses. The risks (without mitigation) have been ranked as moderate. For completeness and to reduce duplication in the document, mitigations have been included in the Risk Assessment Table for easy reference.

Objectives	Performance Targets	Monitoring and Measurement	Mitigations	Review of effectiveness of Management and Mitigations strategies
Minimise discharge of potential pollutants to water, vegetation, air or soils as a result of mining-related activities within the lease area and in transit by road.	1. Minimise risk of incidents resulting in harm to people or environment as a result of handling, storing and transporting flammable liquids	Specific procedures will be developed, through the EMM and implemented, prior to operations commencing, to ensure all environmental monitoring and measurement are carried out consistently and to the standards set by the NT Government and Australian Standards. This will include monitoring, measurement and review of effectiveness, as pre procedures developed within the EMM.	1. Use less flammable materials (e.g. diesel and wherever possible. Minimise use of flammable liquids. All on-site personnel inducted and aware of safe handling procedures. 2.Store all Hazardous Chemicals and Dangerous Goods in approved accordance with Govt Hazardous Chemicals and Dangerous Goods Regulations.	The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies.

Natural Disasters (Fire and Cyclones) Environmental Management Plan

Natural disaster management will require specific management and responses. The risks (without mitigation) have been ranked as moderate. For completeness and to reduce duplication in the document, mitigations have been included in the Risk Assessment Table for easy reference.

Objectives	Performance Targets	Monitoring and Measurement	Mitigations	Review of effectiveness of Management and Mitigations strategies
Minimise harm to personnel and rehabilitation areas in the event of a fire or cyclone.	Minimise risk of injury to personnel on site or in transit to and from site. Minimise Loss of equipment that is essential for fire control Minimise harm to soils, vegetation or water quality as a result of fire events that could be reduced Minimise loss of liquids to soil, water or groundwater that may cause pollution event Minimise damage to environment due to inadequate fire management and suppression.	Specific procedures will be developed, through the EMM and implemented, prior to operations commencing, to ensure all environmental monitoring and measurement are carried out consistently and to the standards set by the NT Government and Australian Standards. This will include monitoring, measurement and review of effectiveness, as pre procedures developed within the EMM.	Maintain firebreaks and roads wide enough to allow personnel to exit quickly. Maintain firebreaks to minimise fires moving into rehabilitation areas. Seek support from local emergency services and Bushfires NT to help limit spread of fires. Provide adequate water supply and water pressure on site to fight spot fires	The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies.

Rehabilitation Environmental Management Plan

Rehabilitation management will require specific management and responses. The risks (without mitigation) have been ranked as moderate. For completeness and to reduce duplication in the document, mitigations have been included in the Risk Assessment Table for easy reference.

Objectives	Performance Targets	Monitoring and Measurement	Mitigations	Review of effectiveness of Management and Mitigations strategies
Rehabilitate disturbed land, after mining, including agreed sustainable post mine land uses	Rehabilitate disturbed land to meet agreed sustainable post mine land uses	Specific procedures will be developed, through the EMM and implemented, prior to operations commencing, to ensure all environmental monitoring and measurement are carried out consistently and to the standards set by the NT Government and Australian Standards. This will include monitoring, measurement and review of effectiveness, as pre procedures developed within the EMM.	Apply rehabilitation methods that meet agreed sustainable post mine land uses	The Environmental Management Manual will be the principal tool for outlining all processes that relate to Environmental Performance Management and review of the effectiveness of mitigation strategies.

5.6.4 Objectives, Targets, Mitigations and Non-Conformances

Objectives and targets and mitigation strategies are outlined in Section 5.6.2 and in the Environmental Management Plans, which are, in turn, linked directly with the Environmental Management Manual (EMM). The EMM will be the core component of the Environmental Management System. The EMM is expected to be completed by end of 2016.

Monitoring will be conducted at a frequency commensurate with the type of risk, the location and regulatory requirements. This will include surface water and groundwater quality, in particular.

Throughout the processes of monitoring, analysis, review and interpretation of data, sampling and monitoring results will be used to identify trends that may require specific responses. Any ongoing adverse trends, when confirmed, will trigger reporting and an elevated level of investigation. Details of monitoring and sampling programmes will be finalised once the EMM is completed and Indigenous trainees have commenced training.

The EMM will address remedial and corrective management Actions as they arise and will be investigated in accordance with EMM. Remedial measures, where necessary, will be addressed in the shortest possible timeframes, depending on the severity of a non-conformance. Any non-conformances that affect environmental performance to a level that requires reporting to the relevant regulatory Authority will be addressed as quickly as practicable.

5.7 Key Environmental Activities for the Oncoming Period

GMC will complete its EMM by end 2016. The manual will be the cornerstone of GMC's Environmental Management System. It will contain all essential procedures and guidance for personnel for ongoing operations and related activities. Other key environmental activities will include:

- Analysis of in-fill drilling results from fourth quarter 2015 drilling campaign
- Completion of the EMM and procedures to direct mining and related activities in 2017
- Complete regulatory requirements, to enable commencement of operations
- Complete inductions for employees and trainees prior to mining and related activities
- Commencement of environmental training for Indigenous trainees, by early 2017

6 WATER MANAGEMENT PLAN

Work Completed

In October, 2015, GMC engaged EcOz Environmental Consulting to identify current information gaps in relation to surface hydrology and hydrogeology on and near the Dhupuma Plateau. The desk top study identified areas of work that would be required to address the information gaps. In April 2016, EcOz was engaged again, to undertake a site-based hydrological and hydrogeological assessment of surface and groundwater resources within EL30226. Key site-based investigations focussed on:

- The location and condition of groundwater bores, their potential to provide information on hydrology of the project area, and their stability for on-going monitoring works
- Suitable locations for the future installation of groundwater monitoring infrastructure
- Surface water resources in close proximity to proposed mining operations
- Identification of surface water locations suitable for monitoring water quality, aquatic biota and groundwater dependence
- Further characterisation of surface and groundwater resources within and around EL30226.

Outcomes from the April 2016 Hydrology and Hydrogeology fieldwork include:

1. Completion of surface and groundwater assessments including:
    a. Groundwater flow maps
    b. Mapping of water sources
    c. Groundwater and surface water samples and analyses
    d. Recommendations for establishing water monitoring program,
    e. Confirmed and where required, installed water monitoring stations
2. Establishment of sampling and monitoring points for the longer term sampling regime
3. Desktop Water Account (utilising Minerals Council of Australia method).

Examples of outputs from the 2016 hydrology and hydrogeology field work include:

Surface Water field assessment summary:

Table 3-1. Surface water field parameters

Parameter	Units	ANZECC FW 95% Guideline-	ADWG - Health and Aesthetic Guideline	DPSW1	DPSW2	DP81
				7/4/16	7/4/16	8/4/16
Time	24 hr	-	-	1300	1700	1000
Flow	(L/s)			58.5	2 - 5	< 1
pH	-	6-8	6.5-8.5	6.72	6.24	6.58
Temp	°C	-	-	30.8	31.5	28.0
ORP	mV	-	-	161	169	184
EC	µS/cm	20 - 250	-	92.1	65.1	473.0
TDS	g/L	-	-	59.8	42.4	300.4
Salinity	ppt	-	-	0.0	0.0	0.2
DO	% sat.	80 - 110	>85	103.5	94.4	67.3
Turbidity	NTU	15	5	7.48	2.89	21.0

Colour Key	
	Does not meet guideline: Australian Drinking Water Guideline (NHMRC, NRMMC, 2011) - Health & Aesthetic
	Does not meet guideline ANZECC Protection of Aquatic Ecosystems (2000) (WATER) - Freshwater 95% protection level
	Does not meet either guideline (NHMRC, NRMMC, 2011 and ANZECC 2000)

Surface Water sample analysis summary:

Table 3-2. Surface water laboratory results

Analyte	Units	ANZECC FW 95% Guideline	ADWG Health and Aesthetic Guideline	DPSW1	DPSW2	DPS1
				07/04/2016	07/04/2016	08/04/2016
Major Anions						
Bicarbonate Alkalinity as CaCO3	mg/L	-	-	<20	<20	23
Carbonate Alkalinity as CaCO3	mg/L	-	-	<10	<10	<10
Nitrate (as N)	mg/L	-	50	<0.02	<0.02	<0.02
Sulfate (as S)	mg/L	-	250	<1	<1	<1
Chloride	mg/L	-	250	24	14	130
Ammonia (as N)		0.01	0.5	0.02	<0.01	0.02
Nitrite + Nitrate as N	mg/L	0.005	-	<0.05	<0.05	<0.05
Nitrite (as N)		-	3	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.14	0.13	<0.1
Total Nitrogen as N	mg/L	0.2	-	0.14	0.13	<0.1
Total Phosphorus as P	mg/L	0.01	-	<0.01	<0.01	0.02
Phosphorous reactive (as P)		0.004	-	<0.05	<0.05	<0.05
Alkalinity (speciated)						
Hydroxide Alkalinity as CaCO3	mg/L	-	-	<10	<10	<10
Total Alkalinity as CaCO3	mg/L	-	-	<20	<20	23
Alkali Metals						
Calcium	mg/L	-	-	1	<0.5	5.7
Magnesium	mg/L	-	-	1.4	0.9	6.3
Potassium	mg/L	-	-	<0.5	<0.5	2.8
Sodium	mg/L	-	180	13	8.5	51
Dissolved Metals						
Aluminium	mg/L	0.055	0.2	<0.05	0.15	0.05
Arsenic	mg/L	-	0.01	<0.001	<0.001	<0.001
Barium	mg/L	-	2	<0.02	<0.02	0.12
Beryllium	mg/L	-	0.06	<0.001	<0.001	<0.001
Boron	mg/L	0.37	4	0.09	<0.05	0.16
Cadmium	mg/L	0.0002	0.002	<0.0002	<0.0002	<0.0002
Chromium	mg/L	-	0.05	<0.001	<0.001	0.001
Cobalt	mg/L	-	-	<0.001	<0.001	<0.001
Copper	mg/L	0.0014	2	<0.001	<0.001	<0.001
Iron	mg/L	-	0.3	0.46	4.2	1.1
Lead	mg/L	0.0034	0.01	<0.001	<0.001	<0.001
Manganese	mg/L	1.9	0.1	<0.005	<0.005	0.036
Mercury	mg/L	0.0006	0.001	<0.0001	<0.0001	<0.0001
Nickel	mg/L	0.011	0.02	<0.001	<0.001	<0.001
Selenium	mg/L	0.011	0.01	<0.001	<0.001	<0.001
Uranium	mg/L	-	0.017	<0.005	<0.005	<0.005
Vanadium	mg/L	-	-	<0.005	<0.005	<0.005

Surface Water field assessment site locations:

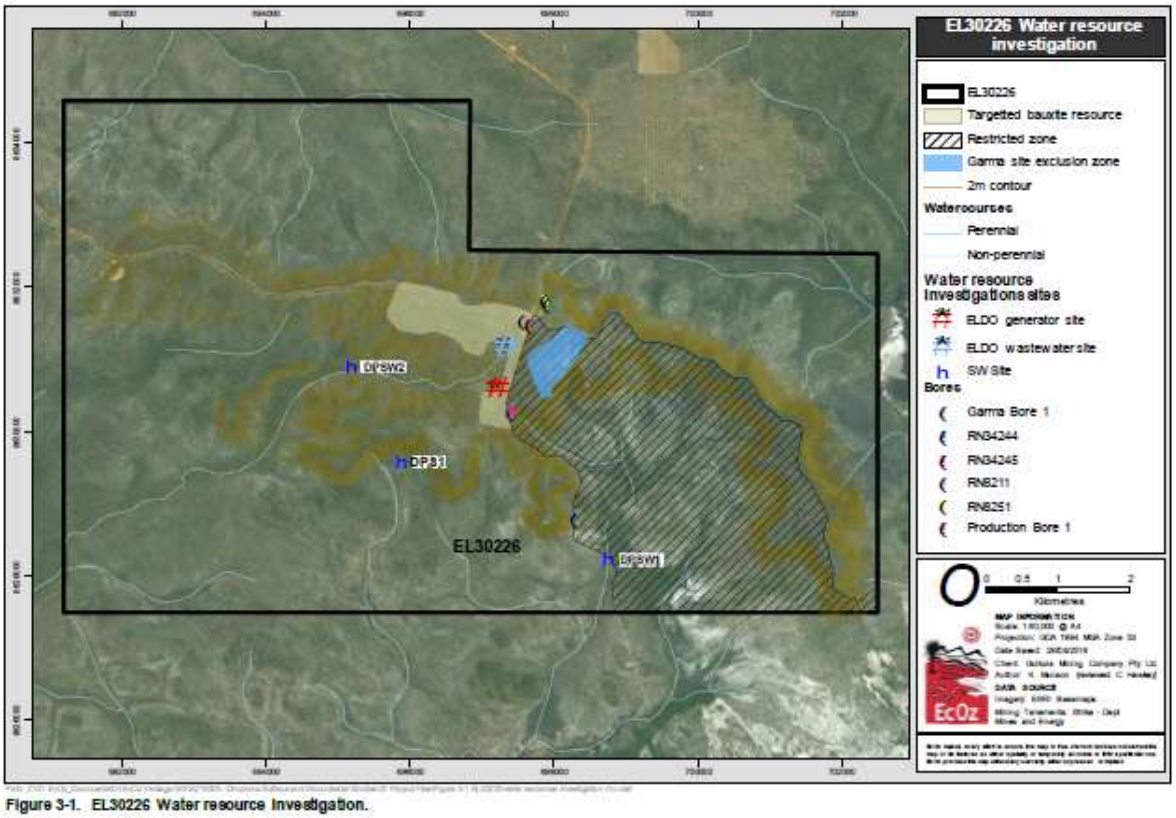

Figure 3-1. EL30226 Water resource investigation.

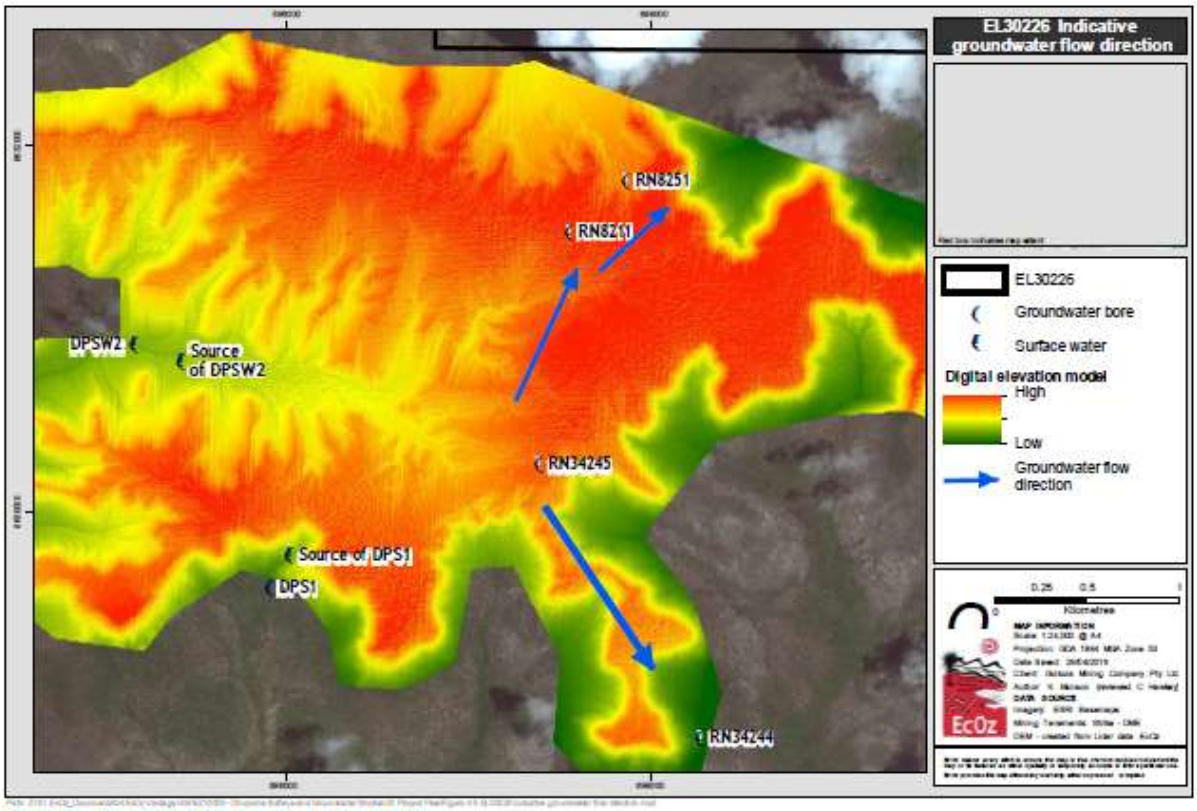

Figure 3-5. EL30226 Indicative groundwater flow direction

Table 3-6. Garma bore laboratory results

Analyte	Units	ADWG Health and Aesthetic Guideline	Garma Bore 07/04/2016
Major Anions			
Bicarbonate Alkalinity as CaCO3	mg/L	-	<20
Carbonate Alkalinity as CaCO3	mg/L	-	<10
Nitrate (as N)	mg/L	50	<0.02
Sulfate (as S)	mg/L	250	<1
Chloride	mg/L	250	13
Ammonia (as N)		0.5	0.12
Nitrite + Nitrate as N	mg/L	-	<0.05
Nitrite (as N)		3	<0.02
Total Kjeldahl Nitrogen as N	mg/L	-	<0.1
Total Nitrogen as N	mg/L	-	<0.1
Total Phosphorus as P	mg/L	-	<0.01
Phosphorous reactive (as P)		-	<0.05
Alkalinity (speciated)			
Hydroxide Alkalinity as CaCO3	mg/L	-	<10
Total Alkalinity as CaCO3	mg/L	-	<20
Alkali Metals			
Calcium	mg/L	-	1.6
Magnesium	mg/L	-	0.7
Potassium	mg/L	-	<0.5
Sodium	mg/L	180	7
Dissolved Metals			
Aluminium	mg/L	0.2	<0.05
Arsenic	mg/L	0.01	<0.001
Barium	mg/L	2	<0.02
Beryllium	mg/L	0.06	<0.001
Boron	mg/L	4	<0.05
Cadmium	mg/L	0.002	<0.0002
Chromium	mg/L	0.05	<0.001
Cobalt	mg/L	-	<0.001
Copper	mg/L	2	0.006
Iron	mg/L	0.3	1.9
Lead	mg/L	0.01	0.006
Manganese	mg/L	0.1	0.011
Mercury	mg/L	0.001	<0.0001
Nickel	mg/L	0.02	<0.001
Selenium	mg/L	0.01	<0.001
Uranium	mg/L	0.017	<0.005
Vanadium	mg/L	-	<0.005
Zinc	mg/L	3	0.006

Work Proposed and in Progress

The design and necessary site-works will be a key part of the MTC programme for local Indigenous trainees and contractors working on site. The EMM includes a water management plan and specific operational procedures for all aspects of water management for mining and related activities on Dhupuma Plateau.

The Water Management Plan will be submitted to the DME prior to commencement of mining activities. A full report on the desktop Study, the site-based hydrological and hydrogeological assessments, and the Water Account are available in Appendices 4, 5 and 7.

GMC will utilise all the data generated from the Environmental Management Manual and Procedures comprehensive environmental monitoring program that includes monitoring of potential onsite and offsite impacts including flora and fauna, groundwater and surface waters to not only monitor water quality, direction of flow and water volumes, but also to specifically target the habitats that may have some potential to provide habitat for the Gove Crow Butterfly (*Euploea alcathoe enastri*) and the Black Footed Tree-rat (*Mesembriomys gouldii gouldii*). The monitoring program will provide for baseline data and allow for quantification of any changes at species level or habitat level.

6.1 Current Conditions

On-site investigations will be completed prior to commencement of mining operations through the MTC. The water balances will include consideration of the full range of climatic conditions the site may experience, i.e., successive drier-than-average seasons and successive wetter-than-average wet-seasons and sensitivity to extreme events.

6.1.1 Surface water

GMC will provide a comprehensive baseline description of surface water conditions (volumes, flows and quality) across the site, as well as a description of the relationship between catchments on the plateau. Relevant regulatory agencies will be provided with the data as it is generated over time.

6.1.2 Groundwater

GMC will provide a groundwater model for the site (to be prepared by a specialist consultant), at an appropriate scale so as to identify any potential impacts, including regional/off site impacts. This will work be carried out to determine directions of flow and capacity of the aquifers under the surface and on the edge of the plateau. The model will be regularly reviewed to ensure it remains relevant and accurate. The first detailed report will be completed and provided to DME prior to commencement of operations.

6.2 Information/Knowledge Gaps

6.2.1 Identification of Information Knowledge Gaps

The GMC EMM will provide the framework for a consistent approach across all mining and related activities for filling information and knowledge gaps. Examples of identified knowledge gaps include:

- Nature of groundwater and surface water flows
- Quality and quantity of groundwater resources on and around the plateau
- Surface water and groundwater quality/chemical composition
- Dry season and wet season flows to vegetation on plateau and slopes below the plateau
- Drainage design to minimise movement of sediment off site, and erosion potential.

All environmental Monitoring plans on site will be established and operated in strict accordance the requirements of the Environmental Management Manual and associated procedures.

6.2.2 Filling Information/Knowledge Gaps

The risk assessment process will be used to help prioritise actions to address knowledge gaps. Risk rankings will be applied to focus attention on the highest priorities first. Mitigations outlined in the risk assessment will also be used to target action items that will improve the current baseline knowledge gaps. Each action item for filling knowledge gaps will have agreed timeframes for addressing issues in Section 5.6.2.

6.2.3 Water Account

A water account based on the Minerals Council of Australia Water Accounting Framework has been completed. See Appendix 7.

No water was extracted for on-site purposes during the September 2014 and November 2015 exploration drilling campaigns.

6.3 Risk Management

The Risk Assessment, risk rankings and risk mitigations are outlined in Section 5.6.2. The risk evaluation process involved direct input from environmental specialists with more than 30 years combined site-based environmental management experience in bauxite mining, particularly in the Gove and Cape York regions

6.3.1 Identify Hazards and Rank Risks

The aspects, processes and experienced personnel are the same as for the Risk Management statement above. Refer to Section 5.6.2 for more details

6.3.2 Actions and Strategies in Response to Identified Risks

Each risk has been identified and summarised in Section 5.6.2 along with its risk ranking and mitigations. GMC is currently preparing its Environmental Management Manual (EMM). The EMM will outline the common process by which risks will addressed in a consistent manner. Each risk will then have its own plan, based on the outcomes for the risk assessment and mitigation table, to minimise environmental impacts.

6.4 Monitoring

6.4.1 Monitoring Program

Refer to programmes and processes for implementing the 'risk-based' approach as below:

The EMM will outline the process that ensures all monitoring is conducted in a consistent manner. For example, each monitoring program will have the following attributes:

- A risk ranking derived from the Risk Assessment results in Section 5.6.2
- A clearly defined monitoring schedule that is appropriate for the risk
- A baseline data set (a combination of historic and new data)
- Clearly defined sampling and monitoring locations appropriate to risk
- GPS coordinates and clear on-site labelling for all monitoring sites
- A prioritised monitoring plan in accordance with its risk ranking
- An annual review to enable the monitoring plan to:
- Bring senior management attention to issues that need to be addressed
- Recommend specific changes that might improve effectiveness and efficiency
- Take account of changes in the mine and the mine plan going forward
- All collected data to be entered into a single storage system with off-site back-up
- All sampling and monitoring methods to recognised standards for each anolyte
- All data anomalies identified and reported within a defined period
- Trigger levels for re-sampling where data indicates levels are outside defined thresholds
- Re-sampling/monitoring where medium-to-high risks may be affected
- Reporting to senior management when risk levels are outside threshold values
- A plan approved by management to address levels outside defined thresholds
- Consistent reporting process to NT DME for risk levels outside agreed thresholds

6.4.2 Data Review and Interpretation

GMC will collect data at a frequency appropriate to the type of risk, the location and the parameters that require ongoing investigation. This will include surface water and groundwater quality, in

particular. Throughout the processes of monitoring, analysis, review and interpretation of data, sampling and monitoring results will be used to identify trends that may require specific responses.

Any ongoing adverse trends, when confirmed, will trigger reporting and an elevated level of investigation. Details of monitoring and sampling programmes will be finalised once the EMM is completed and Indigenous trainees have commenced training. The EMM will address remedial and corrective management Actions as they arise and will be investigated in accordance with EMM procedures, currently in development and expected to be completed by early 2017. Monthly reporting and annual management reviews will ensure remedial and Corrective Management Actions are initiated

Data review and interpretation will be determined as outlined through the EMM, and applying the processes outlined immediately above. GMC will engage skilled specialists wherever technical data collection, interpretation and as required.

6.5 Management

6.5.1 Remedial or Corrective Management Actions

Exploration drilling activities will be monitored visually, and using photographic records. No remedial or corrective actions have yet been required, due to low impact drilling methods, including small bore air core drill and minimal disturbance to root stock and soil.

A more comprehensive environmental monitoring programme will commence by early 2017 as work begins to establish bauxite mining operations. The EMM will address remedial and corrective management Actions.

6.6 Actions Proposed over the Reporting Period and their Potential to Impact on Water Quality

Proposed actions during the reporting period will include:

- Complete site-based Hydrological and hydrogeology investigations
- Establish the groundwater and surface water models
- Apply model outputs and implement agreed monitoring and sampling regimes
- Commence application of the EMM requirements and reinforce key messages for personnel
- Clearing a maximum of 35ha of land in total, over the reporting period.
- Design and install drainage management system on the plateau mine site
- Establish the first mine pit
- Establish haul roads
- Establish access tracks to and from the mine site
- Establish two small borrow pits
- Ensure all personnel are inducted and aware of key water quality and control of water usage are well understood and applied.

Details of the surface water groundwater quality management reports will be provided to the DME as the EMM is completed, prior to commencement of mining and related activities.

The water quality management systems will include, but not be limited to:

- Monthly groundwater monitoring
- Surface water sampling during and after rainfall event
- Design and management of water flow across cleared areas
- Induction and training of employees and trainees

- Monthly and annual review of soil, surface water and groundwater quality trends
- Regular and documented inspection of equipment
- Rapid response system for containing and recovering spills
- Strict speed limits on site to prevent vehicle collisions with monitoring equipment

The hydrology and hydrogeology monitoring and management plan provides a valuable opportunity for indigenous trainees to be directly involved, through the MTC, in work that affects their land and their water. It also opens up options for future work in environmental management.

Their first-hand experience in this area of work will be supported by environmental specialists and other relevant trainers. Baseline sampling and monitoring will begin as soon as trainees have commenced their training. No mine clearing activities will commence until after the baseline survey work and reporting has been completed.

7 INCIDENT REPORTING

Activities on EL30226 commenced in September 2014 after grant of Title, and continued in May 2015. There have been no reportable incidents to date.

Further exploration took place in November 2015, without incident. Mining activities are planned begin, early in 2017. Incident reporting systems will be in place prior to mining activities commencing.

The processes for reporting and managing incidents to minimise further occurrences will include, but not limited to:

- Reporting of identified hazards
- Reporting of accidents/incidents and system failures
- Determining the true cause
- Checklists for investigations
- Corrective actions taken
- Management actions implemented
- Review of corrective and management actions
- Reporting to statutory authorities
- Management of complaints

In addition, and in accordance with Section 29 of the Mining Management Act, all environmental incidents will be recorded in the GMC site register.

GMC will comply with the DME Environmental Incident Reporting Guideline in accordance with Section 29 of the Mining Management Act 2015. Operators will assess the severity of incidents using the matrix provided in the DME's guideline, ('Environmental Incident Reporting Guideline'). Incidents rating Class 2 and above will be reported to the Chief Executive Officer of the Department of Mines and Energy in accordance with the procedures set out in the Guideline.

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8 APPENDICES

8.1 Risk Assessment Matrix

A Risk Assessment Matrix is an example of one of the tools that can assist with the risk assessment process. In assessing the risk:

- Consider what could go wrong?
- Determine how bad the consequences would be.
- Determine the likelihood of it happening
- Calculate the level of risk.

Figure 1: Example of a Risk Assessment Matrix and Interpretation (adapted from Griffith University)

LIKELIHOOD	CONSEQUENCES

LIKELIHOOD	CONSEQUENCES				
	Catastrophic 5	Major 4	Moderate 3	Minor 2	Insignificant 1
Almost certain 5	10	9	8	7	6
Likely 4	9	8	7	6	5
Possible 3	8	7	6	5	4
Unlikely 2	7	6	5	4	3
Rare 1	6	5	4	3	2

Almost certain	Expected to occur in most circumstances	**Catastrophic**	Environmental disaster
Likely	Will probably occur in most circumstances	**Major**	Severe environmental damage
Possible	Might possibly occur at some time	**Moderate**	Contained environmental impact
Unlikely	Could occur at some time	**Minor**	Some environmental impact
Rare	May occur only in exceptional circumstances	**Insignificant**	Low environmental impact

Risk Score	Risk Rating	Action Required
9 - 10	Extreme	Immediate
7 - 8	High	Action plan required. Senior management attention
5 - 6	Moderate	Specific monitoring or procedures required

2 - 4	Low	Management through routine procedures

8.2 Waste Rock Characterisation and Management

From preliminary investigations on site and over 40 years of experience with bauxite mining immediately adjacent to the RTA bauxite mining operation at Gove, waste rock volumes are extremely low and without potential risks in relation to AMD, radiation or chemical risk factors. There will be no need to stockpile of otherwise segregate low grade bauxitic rock.

8.3 Storage, Transport and Handling of Dangerous Goods

GMC transport, storage and Handling of dangerous goods will be carried out in accordance with NT and National Standards. In the first few years of operation, fuel requirements will be small.

Fuels will not be stored on the mine site. No explosives will be required and none will be stored. Wherever it is practicable, on-site mobile equipment and generators will use diesel rather than petrol. Low volumes of fuel will be stored in a dedicated area within the fenced GMC storage compound. Storage facilities will be designed to meet Dangerous Goods Regulations.

The location of hazardous materials will also be indicated on a site layout diagram, prior to commencement of operations. The Department of Mines and Energy will be notified of fuel volumes and storage locations prior to commencement of operations.

Risk Assessment, risk rankings and mitigations for dangerous goods are outlined in in Section 5.6.2. The EMM will include Procedures for all relevant aspects associated with Fuel Management.

Inductions and training for all personnel on site will include targeted sessions on safety and environmental management of dangerous goods. Subject headings will include:

- Identification of hazardous material and storage requirements
- identification of potential and significant environmental impacts
- control strategies implemented
- Understanding of material safety data sheets (MSDS) and where they are located.

8.4 Supporting Information for Statutory Requirements and Non Statutory Obligations

All information required for this relatively small mining operation is available upon request.

8.5 Diagrams

Diagrams plates and maps have been inserted directly into the document for easy reference.

Due to large file sizes, these additional Appendices are held separately by GMC. They will be available upon request.

8.6 Abbreviations

AAPA Aboriginal Areas Protection Authority

ANZECC	Australia and New Zealand Conservation Council
ANZECC	Australian and New Zealand Environment Conservation Council
ARD	Acid Rock Drainage (also known as Acid Mine Drainage – AMD)
AHD	Australian Height Datum
DEE	Department of Environment and Energy
DAWR	Department of Agriculture and Water Affairs *(Commonwealth)*
EAA	*Environmental Assessment Act* (NT)
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management Systems
EPBC Act	*Environment Protection and Biodiversity Conservation Act (Commonwealth)*
GDA	Geocentric Datum of Australia
GEMIS	Global Emission Model for Integrated Systems
IUCN	International Union for the Conservation of Nature
MGA94	Map Grid of Australia 1994
MMA	*Mining Management Act (NT)*
MMP	Mining Management Plan
MSDS	Material Safety Data Sheets
NAF	Non Acid Forming
NRETAS	Department of Natural Resources, Environment the Arts & Sport (NT)
PAF	Potentially Acid Forming
PER	Public Environment Report
RL	Reduced Level (based on AHD)
TSF	Tailings Storage Facility
WMP	Water Management Plan
WRD	Waste Rock Dump

8.7 References

Useful Links and Resources

State Government Departments with relevant guidelines, fact sheets, proformas and codes for environmental compliance:

www.minerals.nt.gov.au	(NT)
www.nretas.nt.gov.au/	(NT)
www.worksafe.nt.gov.au	(NT)
www.dse.vic.gov.au	(VIC)
www.ehp.qld.gov.au/	(QLD)
www.dmp.wa.gov.au/	(WA)

Northern Territory Government

: NT Government Advisory Note: Information Sources for MMP Preparation

http://www.minerals.nt.gov.au/mineralsforms#mining (Accessed 15/08/2012).

: NT Government Department of Natural Resources, Environment, the Arts and Sport database tool:

http://www.ntlis.nt.gov.au/imfPublic/imf.jsp?site=nreta (Accessed 15/08/2012).

Australian Government

: Australian Natural Resource Atlas:

http://www.anra.gov.au/ (Accessed 15/08/2012).

: Environment Australia
www.environment.gov.au (Accessed 15/08/2012).

: Environment Australia Protected Matters Search Tool:

http://www.environment.gov.au/epbc/pmst/index.html (Accessed 15/08/2012).

: Commonwealth of Australia,. Leading Practice Sustainable Development Program for the Mining Industry

http://www.ret.gov.au/resources/resources_programs/lpsdpmining/pages/default.aspx (Accessed 15/08/2012).

:Australian Government - Sustainable Land Management
http://www.environment.gov.au/land/management/ems/index.html (Accessed 15/08/2012).

Other

: Queensland Department of Environment and Heritage Protection.

http://www.ehp.qld.gov.au/land/mining/technical_guidelines.html (Accessed 15/08/2012)..

: EPA Victoria - Sustainable Business

http://www.epa.vic.gov.au/bus/ (Accessed 15/08/2012).

: The Minerals Council of Australia

http://www.minerals.org.au/ (Accessed 15/08/2012).

: Minerals Council of Australia (1997) Mine site Water Management Handbook

: Standards Australia International Limited

: Standards Australia International Limited (Accessed 15/08/2012).

: Western Australia Department of Mines and Petroleum

http://www.dmp.wa.gov.au/documents/Mine_Closure(2).pdf (Accessed 15/08/2012).

:DME (1995). *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.* Department of Minerals & Energy, Queensland.

International Erosion Control Association

http://www.austieca.com.au/