SCONI Project
Initial Advice Statement

Metallica Minerals Limited
August 2012

Document History and Status

Issue	Rev.	Issued To	Qty	Date	Reviewed	Approved
1	draft	NC	1	5/03/12	JB	JB
1	1	AARC	1	22/03/12	NC	ABP
1	2	NC	1	03/04/12	ABP	NC
1	3	EHP	1	14/05/12	JB	NC
1	4	NC	1	24/05/12	JB	NC
1	5	EHP	1	18/06/12	JB	NC
1	6	EHP	1	06/07/12	JB	NC
1	7	EHP	1	20/08/12	JB	NC

Project Manager: Julie Byrd

Name of Client : Metallica Minerals Ltd

Name of Project: SCONI Project

Title of Document: Initial Advice Statement

Document Version: Final Rev 7

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Note: The SCONI project was previously called the NORNICO project, however, it has been renamed to avoid confusion with a previous MLM project, and to reflect the importance of Scandium.

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LIST OF ABBREVIATIONS

℃	-	degrees Celsius
ANZECC	-	Australia and New Zealand Environment Conservation Council 2000
BoM	-	Bureau of Meteorology
CCD	-	Counter-current Decantation
CMN	-	Cobalt, Manganese, Nickel Separation Process
DAFF	-	Department of Agriculture, Fisheries and Forestry
DEEDI	-	Department of Employment, Economic Development and Innovation
DERM	-	Department of Environment and Resource Management
DNRM	-	Department of Natural Resources and Mines
DSEWPAC	-	Department of Sustainability, Environment, Water, Population and Communities
EA	-	environmental authority under the *Environmental Protection Act 1994*
EIS	-	Environmental Impact Statement
EHP	-	Department of Environment and Heritage Protection
EM plan	-	Environmental Management Plan
EP Act	-	*Environmental Protection Act 1994 (Qld)*
EPBC Act	-	*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*
EPM	-	Exploration Permit for Minerals
EPP	-	Environmental Protection Policy
ERAs	-	Environmentally Relevant Activities
ESA	-	Environmentally Sensitive Area
g/t	-	grams per tonne
GPL	-	General Pastoral Land
ha	-	hectares
HPAL	-	High Pressure Acid Leaching
IAS	-	Initial Advice Statement

ILUA	-	Indigenous Land Use Agreement
kl	-	kilolitres
km	-	kilometres
kPa	-	kilopascal
l	-	litre
LME	-	London Metal Exchange
LPG	-	liquefied petroleum gas
m	-	metre
Mlpa	-	megalitres per annum
ML	-	Mining Lease
MLA	-	Mining Lease Application
MLM	-	Metallica Minerals Limited
mm	-	millimetres
mmpa	-	millimetres per annum
MNES	-	Matters of National Environmental Significance
MPag	-	megapascals (gauge)
MR Act	-	*Mineral Resources Act 1989 (Qld)*
Mt	-	million tonnes
Mtpa	-	million tonnes per annum
MW	-	megawatts
NGER Act	-	*National Greenhouse Gas and Energy Reporting Act 2007*
NGER	-	National Greenhouse and Energy Reporting
PLS	-	pregnant leach solution
QLD	-	Queensland
SAG	-	semi-autogenous grinding
SOFC	-	Solar Oxide Fuel Cells

SUSOP	-	Sustainable Operations
REDD	-	Regional Ecosystem Description Database
RSF	-	Residual Storage Facility
t	-	tonnes
tpa	-	tonnes per annum
tpd	-	tonnes per day
VM Act	-	*Vegetation Management Act 1999*
w/w	-	wet weight

1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

This Initial Advice Statement (IAS) has been prepared on behalf of Nornico Pty Ltd, the Proponent for the SCONI Project (the Project). *Note: The Project was previously called the NORNICO Project and has been renamed to SCONI Project to highlight the importance of scandium*. It identifies the potential environmental impacts associated with the construction and operation of a proposed open-cut nickel, cobalt and scandium mine near Greenvale in Northern Queensland

1.2 BACKGROUND

NORNICO Pty Ltd, a wholly owned subsidiary of Metallica Minerals Ltd (MLM), is proposing to develop the SCONI Project. Construction works are anticipated to commence in 2014.

The Project site comprises of five nickel laterite deposits: Greenvale, Lucknow, Kokomo, Minnamoolka and Bell Creek. The Project aim is to develop the Greenvale, Lucknow and Kokomo deposits as ore feed. The Minnamoolka and Bell Creek deposits are currently not part of the Project.

The Project site will comprise three mining leases (ML). Applications have been lodged with the Queensland Government as follows:

- Mining Lease Application (MLA) 10368 (Greenvale)
- MLA 10366 (Lucknow)
- MLA 10342 (Kokomo).

Greenvale is located on the former Greenvale Nickel Mine site and is the preferred location for the processing facilities. Greenvale is located within Exploration Permit for Minerals (EPM) 11223, approximately 6 kilometres km from the Greenvale Township.

Lucknow is located 2 km southwest of the Greenvale Township and 8 km southeast of the former Greenvale Nickel Mine. Lucknow is held under EPM 10680 and EPM 10866.

Kokomo is located 55 km to the north of the Greenvale Nickel Mine and is held under EPM 10699 and EPM 13873.

The Project is expected to process approximately 750,000 to 1,000,000 tonnes per annum (tpa) of ore through the High Pressure Acid Leaching (HPAL) process plant, producing either a nickel-cobalt concentrate or metal ingots and scandium oxide. The expected mine life is a minimum of 20 years.

1.3 THE PROPONENT

The Proponent for the Project is Nornico Pty Ltd a wholly owned subsidiary of Metallica Minerals Limited an Australian resource development company with major project interests in nickel, cobalt, scandium, zircon, rutile and limestone. The Proponent's contact details are as follows:

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1.4 PROJECT LOCATION

The Project is located within the Greenvale Nickel Province (Figure 1). The Project is wholly located in the Charters Towers Regional Council area. The Project location for the HPAL process plant and infrastructure will be at the former Greenvale Nickel Mine, which was closed in 1992. Ore will be mined and processed at Greenvale. Residue Storage Facilities (RSF) will be constructed at Greenvale adjacent to the HPAL process plant. Final infrastructure locations are yet to be confirmed through studies and site geotechnical investigations. Satellite ore bodies at Lucknow and Kokomo will be open-cut mined and the ore trucked to Greenvale for processing. Charters Towers, located 205 km to the southeast, is the closest regional centre. Townsville, located approximately 200 km to the east southeast, is the nearest shipping port.

1.5 PROJECT NEED

Scandium Overview

Scandium (Element 21) is considered one of the 17 rare earth elements and one of the most valuable. Although scandium is widely distributed in the earth's crust in trace amounts, it is very rarely enriched or concentrated to exploitable levels and therefore high grade large tonnage mineable scandium deposits are scarce. Scandium shares similar properties to other more abundant and commonly used strategic technical metals such as titanium, zircon and yttrium. Scandium has unique properties that can enhance our technological future. The applications of scandium are increasing because of its specific mechanical and chemical properties, and hence there is a growing market demand. The current uses of scandium include:

1. **Scandium- Aluminium alloys**: Superior qualities including light weight, high strength, superior weldability, good thermal resistance, corrosion resistance and long durability. Used in aerospace, transport industry, premium bicycle frames, golf clubs
2. **Solid Oxide Fuel Cells (SOFC**): Scandium SOFCs can be used to convert natural gas and renewable energy sources into electricity. Scandium SOFCs are more efficient than any other fuel type; the use of SOFCs could become widespread as a cleaner alternative to coal fired power plants
3. **Lighting**: Scandium lights are more efficient in terms of lumens per watt and create an artificial white light that mimics sunlight.

The current annual consumption of scandium is 5-10 tpa. This level of consumption is largely due to a lack of supply. Scandium is proven in its various uses and it is believed that demand could significantly increase if a large and reliable supply of scandium could be delivered to the market.

Nickel Overview

The stainless steel industry is the single largest consumer of nickel. Whilst stainless steel consumption is stagnant, and in places is slowly shrinking within established regions (Europe, North America, Japan), it is growing in emerging markets (China, India, Brazil). China has become the world's dominant stainless steel producer and user. India's stainless steel markets have grown steadily in the past and are expected to grow around 9.0% per annum in the foreseeable future.

Although approximately 40% of the world's nickel reserves are in sulphide ore deposits, approximately 60% of annual nickel production comes from sulphides. This trend is not sustainable in the long term, particularly because there is a lack of new significant sulphide discoveries and new projects. Nickel mined from laterite ore deposits is expected to meet future world demand. Forecast production increases in the stainless steel industry going forward will drive an increase in nickel demand.

Project Opportunity

The Project targets the largest known scandium deposit in the world and will allow MLM to become a leading market supplier of scandium. From ongoing discussions with potential end users of scandium, MLM believes that immediate annual consumption would be approximately 40 tonnes (t). Therefore, the Project will initially produce 7,000 t of nickel-cobalt metal and 40 t of scandium oxide. As the demand for scandium grows, the Project's scandium oxide production will increase. There are sufficient mineral resources for a 20+ year mine life, and high grade zones will be selectively mined in the first few years of operation.

1.6 PROJECT TENURE

NORNICO Pty Ltd currently holds the EPM tenures as described in section 1.2 of this IAS. The underlying cadastral tenure is shown in Table 1, and the background land use is cattle grazing.

Table 1 presents underlying cadastral tenures for each MLA associated with the Project. Refer to Figure 2 – Figure 4 for Project boundaries.

Table 1 Cadastral Properties Associated with Project Tenure

Tenement	Lot	Plan
Greenvale (MLA 10368)	501	SP232789
Lucknow (MLA 10366)	1	CLK40
Kokomo (MLA 10342)	4	SP232791

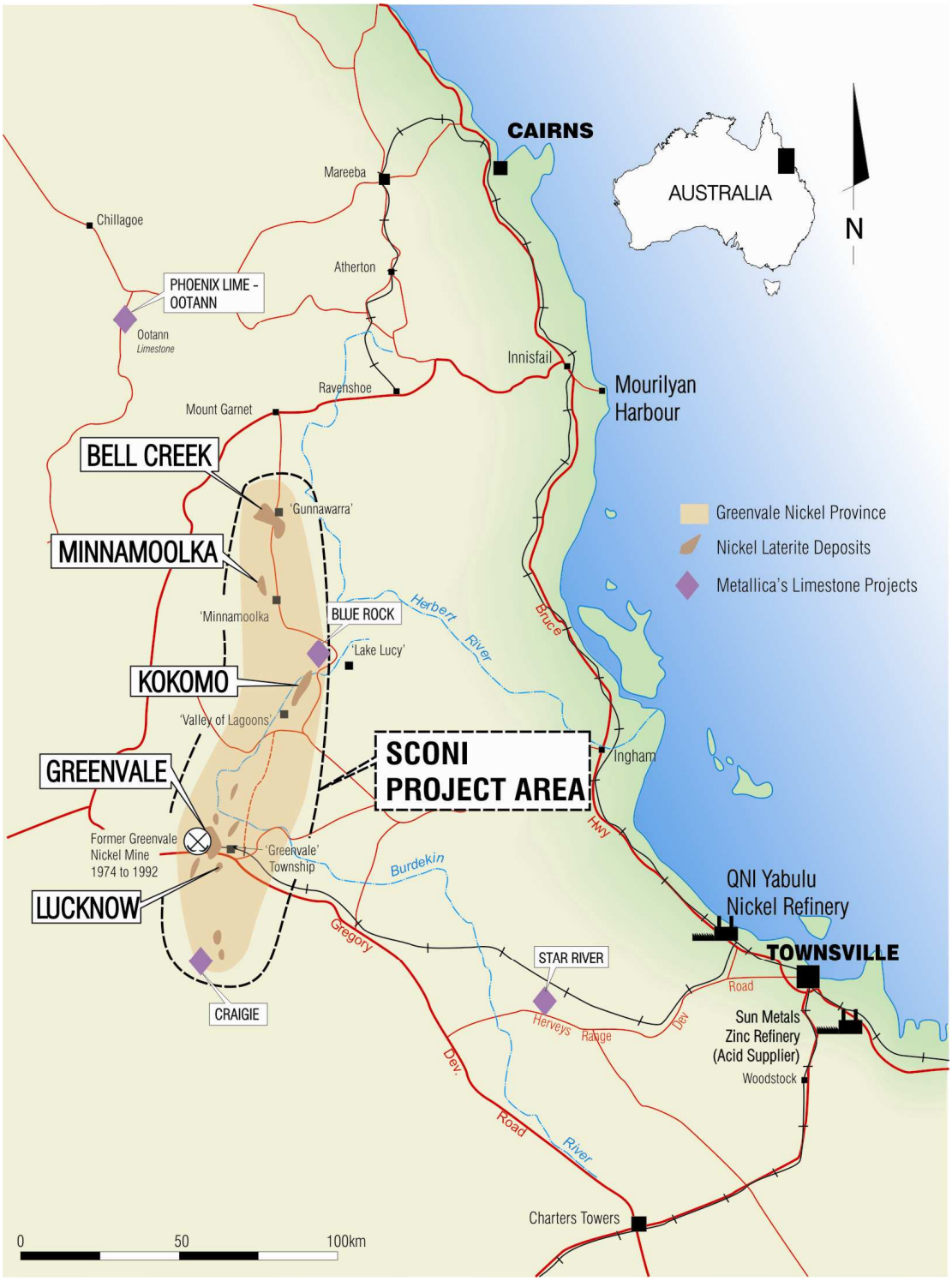
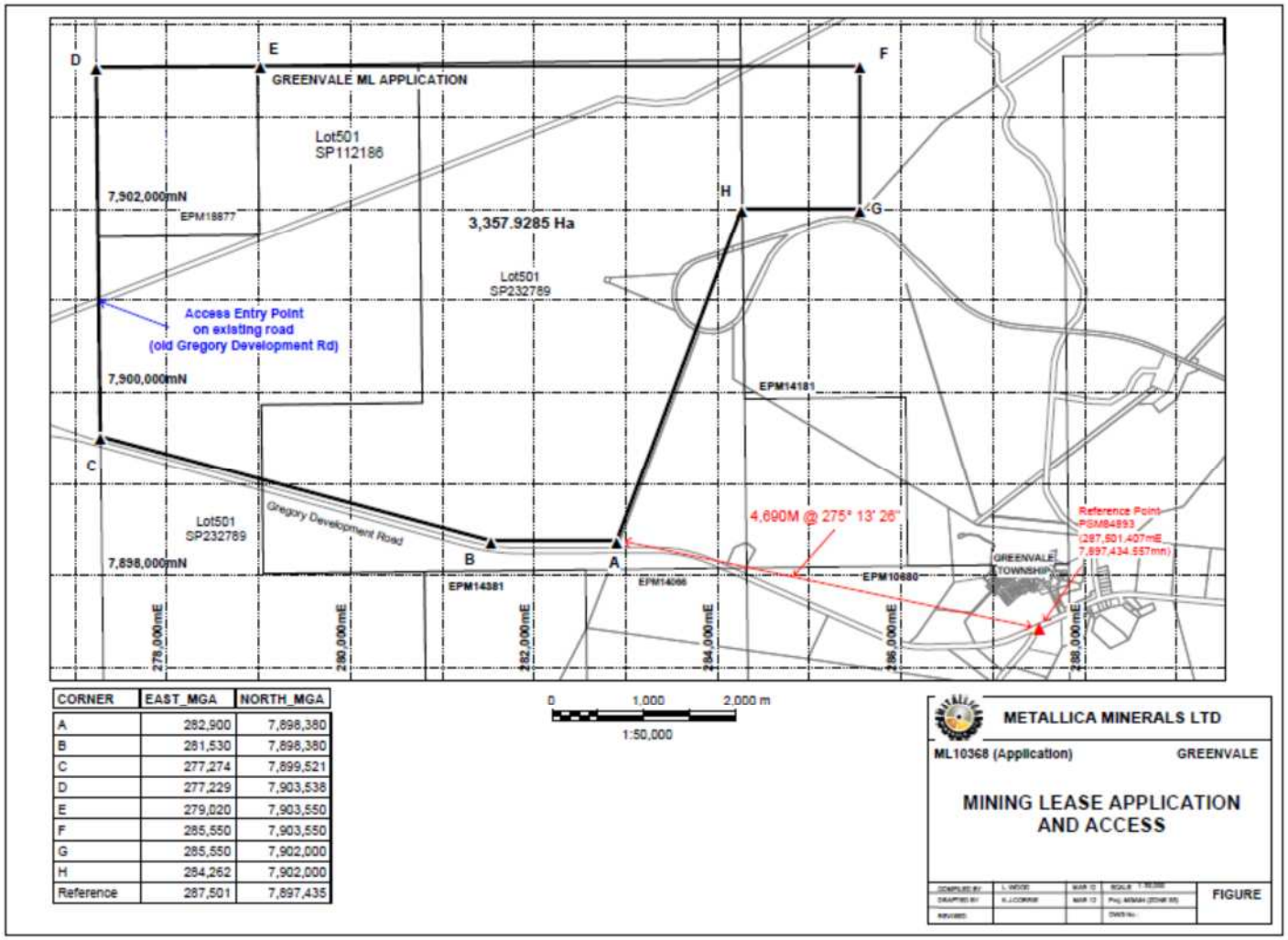
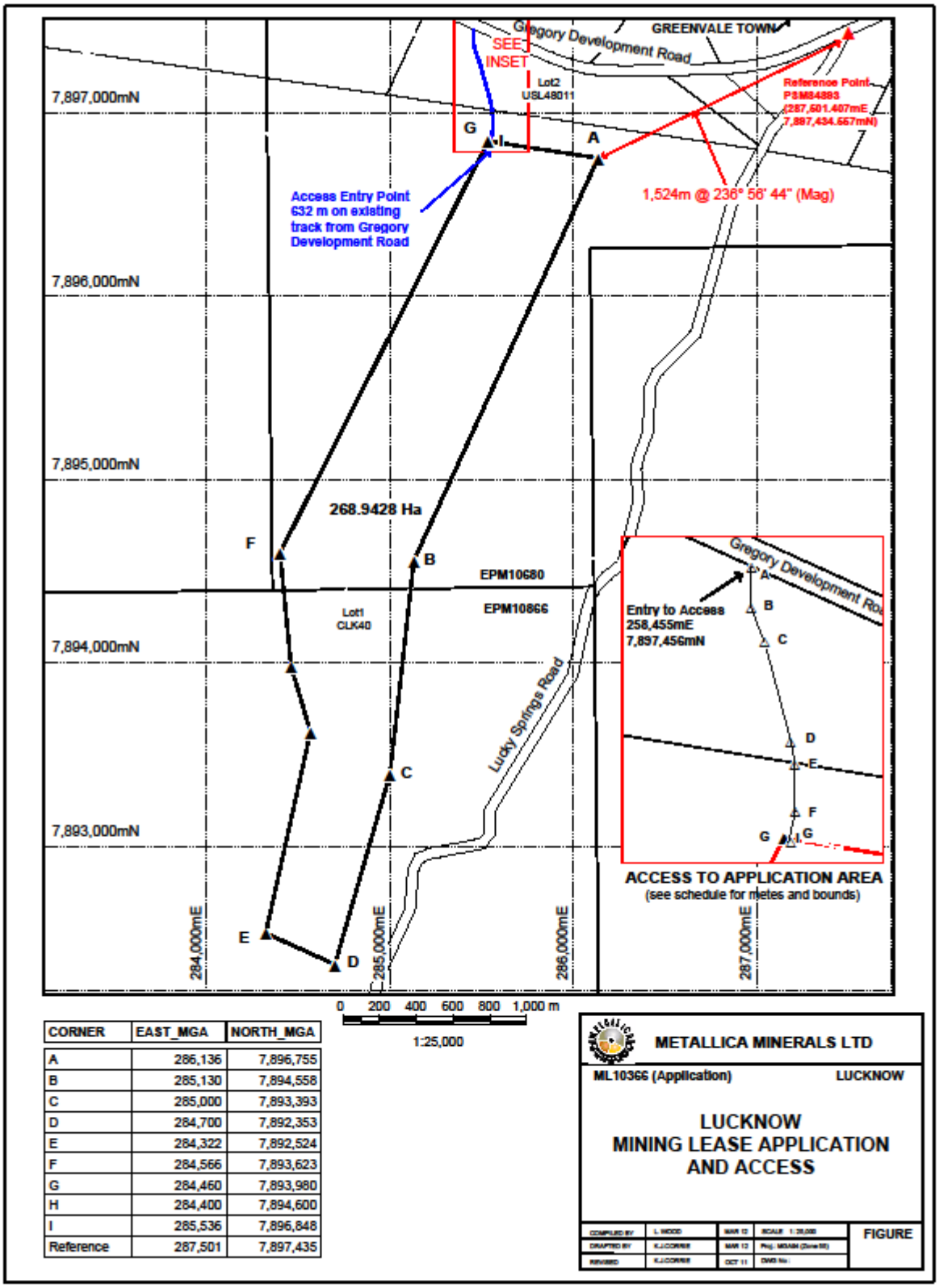


Figure 1 Regional Project Location



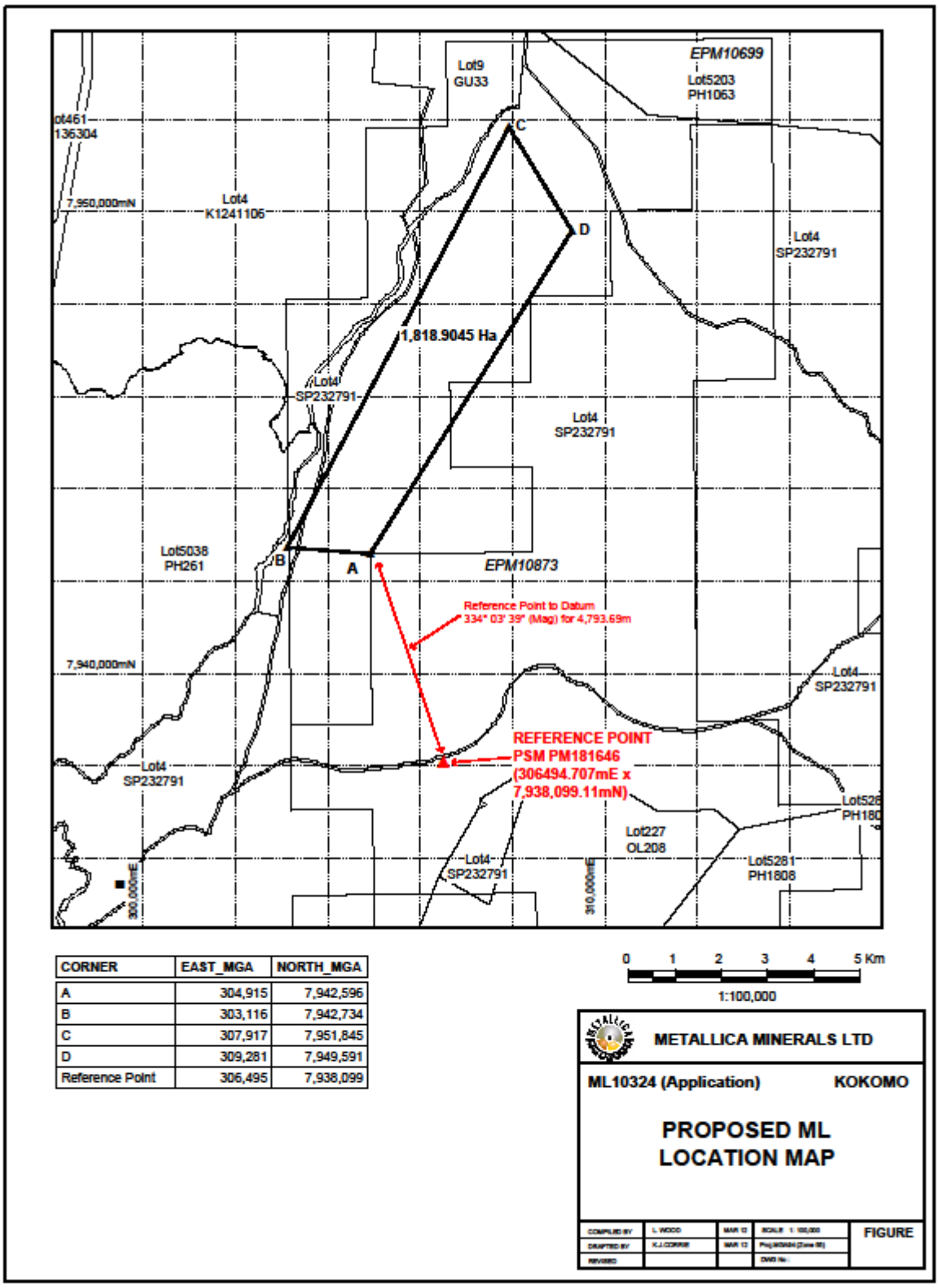
CORNER	EAST_MGA	NORTH_MGA
A	282,900	7,898,380
B	281,530	7,898,380
C	277,274	7,899,521
D	277,229	7,903,536
E	279,020	7,903,550
F	285,550	7,903,550
G	285,550	7,902,000
H	284,262	7,902,000
Reference	287,501	7,897,435

Figure 2 Greenvale Location



CORNER	EAST_MGA	NORTH_MGA
A	286,136	7,896,755
B	285,130	7,894,558
C	285,000	7,893,393
D	284,700	7,892,353
E	284,322	7,892,524
F	284,566	7,893,623
G	284,460	7,893,980
H	284,400	7,894,600
I	285,536	7,896,848
Reference	287,501	7,897,435

Figure 3 Lucknow Location



CORNER	EAST_MGA	NORTH_MGA
A	304,915	7,942,596
B	303,116	7,942,734
C	307,917	7,951,845
D	309,281	7,949,591
Reference Point	306,495	7,938,099

Figure 4 Kokomo Location

2.0 PROJECT ALTERNATIVES

2.1 PROJECT LOCATION

The Project location is dictated by the location of the in situ nickel-cobalt-scandium resource in and around the former Greenvale Nickel Mine with satellite ore bodies at Lucknow and Kokomo. Mine planning and engineering studies have identified that the most economical way of extracting the proposed mineral resources is through open-cut mining. Siting of the HPAL process plant and other infrastructure at the former Greenvale Nickel Mine will utilise already disturbed areas, which will reduce the need for new disturbance areas.

2.2 THE 'NO ACTION' OPTION

The Project has a direct, positive economic impact for the State of Queensland, via the development of the mine to make best use of the existing resource. A no action approach would result in a valuable nickel-cobalt-scandium resource to remain undeveloped, and incur a loss of economic benefits to Federal, State and Local governments.

2.3 PORT OPTIONS

The Townsville Port Authority has advised that they have the current capacity and logistics to handle all imported equipment during construction and operational bulk imports like sulphur. Townsville is the closest port to the Project. Other Port Authorities can be approached, however, it is anticipated that the use of the Cairns or Mackay Ports would incur extra transportation costs. All materials will need to be road transported to Greenvale, as the Greenvale rail line was decommissioned in 1994.

3.0 PROPOSED PROJECT ACTIVITIES

3.1 MINERAL RESOURCE

The Project has a current mineral resource definition containing:

- Ni-Co resource of 50 Million tonnes (Mt) at 0.81%Ni and 0.09% Co (406,000 t Ni and 44,000 t Co)
- Scandium resource of 16.8 Mt at 130 grams per tonne (g/t) Sc (3,250t Sc_2O_3).

The expected mineral reserves will be initially processed through a 750,000 tpa HPAL process plant producing approximately 7,000 t Ni + Co and 40-120 t Sc over a 20 year mine life. There is opportunity to increase production through expansion or upgrades to 1,000,000 tpa.

The Project mine life could be extended by further exploration success. Opportunities may exist through the review of potential beneficiation of lower grade material remaining in the former Greenvale Nickel Mine, as well as the discovery of additional mineral resources.

3.2 PROPOSED OPERATIONS

The Project includes three proposed MLAs, which cover an area of approximately 3,340 hectares (ha) at Greenvale, 269 ha at Lucknow and 1,827 ha at Kokomo. The actual mining disturbance at Greenvale will be contained within the previously mined Greenvale Nickel Mine site (Figure 2). The proposed Mine Plan will see initial mining of the Greenvale Ni-Co resource as well as the high grade Lucknow scandium resource. Ore from Lucknow will be mined and trucked to the Greenvale HPAL process plant (approximately 8 km away). Kokomo ore will not be mined until year 5 in the mine schedule. Ore will be trucked over a distance of 55 km to the Greenvale HPAL process plant. High grade scandium ore (up to 100,000 tpa) may be trucked to Townsville and then shipped to a specialist plant to extract the scandium during the HPAL process plant construction.

Major Project activities are as follows:

- open cut mining via free digging, conventional drill and blast and truck and shovel operations
- processing of the mined nickel-cobalt scandium ore at the HPAL process plant
- residual waste from the HPAL process plant will be neutralised and stored in an engineered RSF
- transport via road of selected high grade scandium laterite ore to the port of Townsville for processing overseas during the initial construction phase.

3.3 EXPLORATION

Exploration and drilling activities are currently continuing and will continue on the Project site to determine additional mineral resources. Access tracks, drill pads and sumps will be constructed as necessary. Where practicable existing roads and pads will be used.

An assessment of the of the former waste rock dumps on the Greenvale Nickel Mine site has commenced to determine if there is sufficient nickel contained within the waste dumps that could be processed through the HPAL process plant.

3.4 VEGETATION REMOVAL AND TOPSOIL STRIPPING

Prior to the development of any open cut pits, processing facilities, waste rock dumps, the RSF, evaporation ponds or other infrastructure, vegetation and topsoil will be removed from the footprint area and stockpiled. The preferred option for large vegetation is to clear and use the timber for milling and wood-chipping. Smaller vegetation and grasses will be removed with the topsoil and stockpiled in windrows no higher than 5 metres (m) and managed to prevent erosion. Topsoil will be respread on surfaces to be rehabilitated to benefit from the viability of the topsoil seed bank.

3.5 LAND USE AND CAPABILITY

The land on the Project site is currently used for low-intensity cattle grazing. The Greenvale Nickel Mine site was mined from 1974 to 1992. Some areas of the former Greenvale Nickel Mine site have been successfully rehabilitated resulting in well-grassed areas and little erosion. Other areas are sparsely vegetated with internally draining flooded pits. The pits hold good quality water, which is used for cattle grazing dry season watering through a reticulation system.

3.6 LAND DISTURBANCE

At Greenvale where the majority of the mining and processing will take place, the major disturbance will be contained within the existing 700 ha former Greenvale Nickel Mine. The proposed HPAL process plant will be located on previously mined areas and will cover approximately 500x400 m. Mineral resources are located adjacent to former pits. New disturbance areas proposed are on sparse bushland country with a high level of erosion on the western side of the former Greenvale Nickel Mine where the RSF and small evaporation ponds are to be located. RSF and evaporation pond total areas are approximately 190 ha. Final locations are still to be determined following geotechnical assessment. On site water management options include construction of a raw water dam to manage water supply harvested during the wet season and preliminary pit dewatering prior to mining. A proposed raw water dam site is located immediately downstream of the Stenhouse dam. The Stenhouse dam is currently used as a recreational site (kayaking and swimming) by the landowner, as well as a stock watering point for the landowner's cattle. Preliminary engineered dam options indicate a surface area of between 54-85 ha and wall height to 13.5 m depending on design capacity, which will be decided as part of an overall Project Water Management Plan.

The Lucknow mining disturbance is predicted to be 25 ha and will comprise shallow pits (maximum depth 50 m), starter waste dumps, sediment catchment dams and access roads.

The Kokomo mining disturbance is predicted to be 65 ha and will comprise of shallow pits (maximum depth 50 m), starter waste dumps, sediment catchment dams and access roads.

Post mining land-use will be similar to pre-mining land use, i.e. cattle grazing. It is expected that following completion of mining activities, the Project site will be returned to similar land uses and an internal flooded pit wetland system at Greenvale will be created.

3.7 MINE INFRASTRUCTURE

The following mine infrastructure and facilities will be required for the Project:

- open cut mining
- ore stockpiles
- ore preparation plant
- HPAL process plant
- Residue Storage Facility
- sulphuric acid plant
- raw water storage dam
- steam turbine power station (capacity 15-18 megawatts (MW))
- sediment catchment dams
- small evaporation ponds
- engineered waste rock dumps
- hydrocarbon and chemical storage
- waste facilities
- workshops, warehouse and office facilities
- light vehicle access roads and heavy vehicle haul roads.

3.8 MINING AND ORE PROCESSING OVERVIEW

The following sections provide a brief description of the major activities that will be undertaken as part of the Project. A simplified inputs and outputs diagram is shown in Figure 5 for the mining and HPAL process plant. The main steps of the process are described below.

3.8.1 Open Cut Mining

The ore will be mined using traditional open cut methods. Mining will use excavators to extract the ore and load into dump trucks that will deliver the Greenvale ore directly to the HPAL process plant. Ore mined from Lucknow and Kokomo will be loaded into highway compliant road train tippers and transported to Greenvale. The open cut pits will be shallow and usually less than 50 m deep as the minerals are found in the laterite surface ore. Small waste rock dumps will be constructed at each location, however, there is an opportunity to progressively back fill fits as part of the mine plan.

3.8.2 Ore Stockpiles

The ore at Greenvale will be either directly tipped into the primary crusher at the HPAL process plant or placed on an ore stockpile. The stockpiled ore will be moved from the stockpiles into the primary crusher using rubber tired front end loaders. It is expected that a number of ore stockpiles will be required at Greenvale. Ore stockpiles foundations will have a compacted foundation and be bunded to trap any sediment losses that may occur during wet season rains.

3.8.3 Ore Preparation Plant

Soft laterite ores will be trucked to the ore preparation plant where they will be crushed to <150 millimetres (mm) using a roll sizer crusher. The crushed ore and water is fed into a semi-autogenous grinding (SAG) mill for grinding into fine particles to increase surface area and reactivity for leaching. Oversize material will be separated by the scrubber and recycled back into the SAG mill for retreatment. Water will then be added to the ground ores to form a 40% wet weight (w/w) slurry. The slurry is stored in a tank prior to leaching.

3.8.4 High Pressure Acid Leaching Process Plant

The ore slurry containing the nickel-cobalt-scandium is stored in tanks adjacent to the HPAL process plant and will be transferred to a pre-heating unit, where it is heated to 200 degree Celsius (^{o}C) using steam and direct-contact heaters and then pumped into an HPAL autoclave. The autoclave operates at high temperatures (255^{o}C) and pressure. Concentrated sulphuric acid (98.5% w/w) and steam are injected into the autoclave, which extracts the nickel, cobalt and scandium from the laterite ores. The hot, leached slurry is discharged from the autoclave to a flash tank and cooled to ambient temperature and pressure through a three-stage process by releasing steam which is captured and recycled to the feed heaters. The cool slurry is sent to a Counter Current Thickener where the solids and liquid are separated. The liquid leach solution containing the dissolved metals is sent to the scandium solvent extraction circuit.

3.8.4.1 Scandium Recovery

Scandium is separated from nickel and cobalt by selective extraction from the leach solution using an organic solvent. Further purification of the scandium is achieved by selective stripping from the organic solvent back into an aqueous solution. Scandium hydroxide is precipitated from the aqueous solution and calcined (i.e. thermally heated) to produce pure scandium oxide product.

The slurry that was separated prior to scandium recovery is neutralised to remove the remaining acid using lime or limestone.

This slurry is then sent to the Current Counter Decantation (CCD) circuit for solid-liquid separation and recovery of the nickel and cobalt.

3.8.4.2 Current-counter Decantation

A multi-staged CCD washing circuit will be required to achieve optimum nickel and cobalt recovery. This is where the nickel-cobalt enriched solutions will be separated from the from the remaining

barren leached solids, i.e. the CCD will separate out a solution containing the nickel and cobalt that has been removed from the ground up ore, leaving the ore behind to be disposed of in the RSF.

3.8.4.3 Impurity Removal

Impurities will be removed by adding limestone and lime to raise the solution pH to 4.5 to precipitate iron, aluminium and chromium and other metals. Gypsum is also precipitated. The waste solids and impurities are separated by thickening and pumped into the CCD train, where further trapped soluble nickel and cobalt can be recovered.

3.8.4.4 Metal Recovery

The Cobalt, Manganese, Nickel Separation Process (CMN) process is a nickel refining technology developed specifically for processing leach solutions containing nickel, cobalt and manganese. The process uses proven solvent extraction reagents to extract and recover nickel and cobalt into separate refined metals. The major steps involved include:

- the primary metals are extracted from the liquor an organic phase composed of magnesium loaded versatic acid
- the magnesium loaded extractant is formed using lime via a patented process technology
- the loaded organic phase containing nickel and cobalt is mixed with nickel chloride solution that separates the cobalt and other non-nickel metals from the solution. the nickel is then extracted to produce London Metal Exchange (LME) grade nickel cathode by electrowinning
- the nickel chloride solution containing cobalt is further processed to produce high purity cobalt sulphide suitable for sale.

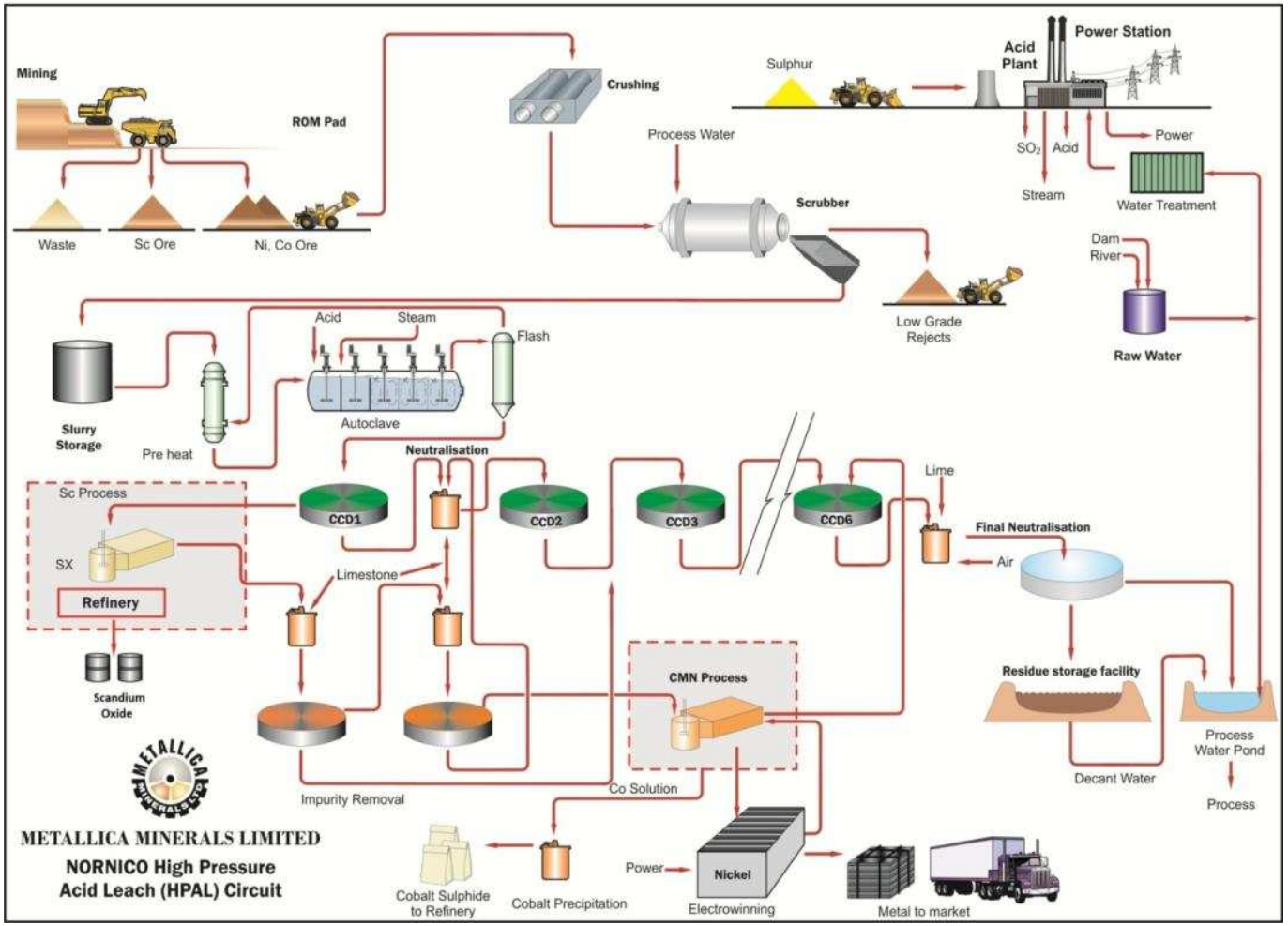


Figure 5 Inputs / Outputs Conceptual Diagram

3.8.5 Residue Storage Facility (RSF)

The waste residue stream will be treated with lime. High levels of lime will precipitate out iron, manganese, aluminium and other metals and also magnesium sulphate salts, converting them to gypsum. The residue will be a neutral pH product thickened to about 32% solids content and slurry piped to a multi cell RSF that will comply with the Queensland Government Hazardous Dams Guideline. This will enable high volumes of good quality water to be directly recovered for recycling back through the HPAL process plant.

Return water and incident rainfall contained in the RSF will be decanted and pumped to a lime treatment tank to further remove soluble magnesium sulphate and the recovered water recycled as process water. GHD Consultants have completed a preliminary options study investigating suitable sites for the RSF. The preliminary preferred location for the RSF is to the west of the former Greenvale Nickel Mine northern pit and comprises of a clay lined low permeability facility covering approximately 190 ha. At present, MLM is still in the process to determine the most efficient residue handling techniques to maximise densities within the RSF and optimise water recoveries. A small evaporation pond or sediment catchment dams will be required in addition to the RSF. Final designs and configuration will be addressed in the EIS.

3.8.6 Sulphuric Acid Plant

Prilled sulphur will be imported to the Townsville wharf and then transported by road to Greenvale. The sulphuric acid plant will manufacture 98.5% w/w sulphuric acid up to 1,000 tonnes per day (tpd) for the pressure leaching. It will also generate high pressure (6100 kilopascal (kPa)) superheated steam for use in the HPAL process plant and for the steam turbine power plant. The sulphuric acid will be stored in 5,000 t tanks with a supply at 100% operation for 7 days. All chemical storage, transportation and handling will be designed to meet AS 1940:2004.

3.8.7 Product Transport

Final product LME nickel, cobalt sulphide concentrate and scandium oxide will be containerised and trucked from the Project site to the Townsville Port via the Gregory Developmental Road. These materials will then be exported to overseas markets.

3.9 WATER REQUIREMENTS AND SUPPLY

The Project lies within the Upper Burdekin River Basin. Rainfall is characterised by high seasonal and annual variability with an average of 681 millimetres per annum (mmpa) and single year ranges from a minimum of 180 mmpa to 1,665 mmpa. Stream flows are ephemeral with only the Burdekin River having continuous flow. The Queensland Government has installed a series of gauging stations upstream and downstream of the Project area.

Discussions with Water Resources staff of the former Department of Environment and Resource Management (DERM) and drilling results indicate that groundwater reserves at Greenvale are fractured low yielding supplies. No groundwater was encountered during drilling at Lucknow and Kokomo, which is expected as these sites are situated on mesas. Mesas are elevated areas of land with a flat top and sides that are usually steep cliffs.

The estimated total water demand for the Project is approximately 4,000 megalitres per annum (Mlpa). GHD consultants have completed a phase 1 water supply and surface water assessment for the Project. The water supply options available for the Project include:

- continued use/augmentation of the existing systems catering to Greenvale Township or existing water storage provided by the Stenhouse dam and flooded pits
- recycling of rainfall runoff from impacted mine catchments, the HPAL process plant bunded area, RSF and sediment dams and evaporation ponds
- minimising design Project water use and maximising recycling
- provision of additional 'clean' water capture and storage facilities in and around the proposed mine sites
- water extraction from the Burdekin River.

3.10 POWER REQUIREMENTS AND SUPPLY

A standalone power plant, with a capacity of 15 – 18 MW, will be constructed on the Project site adjacent to the HPAL process plant. The power plant will utilise high pressure steam from:

- heat energy that has been recovered from the waste heat boilers in the sulphuric acid plant
- auxiliary Liquefied Petroleum Gas (LPG) fired boilers, that will produce supplementary steam on demand.

The Project will seek an arrangement with local power distribution companies to feed excess power back into the grid. For cold start-ups and construction power will be purchased from the grid.

3.11 BUILDINGS

A number of buildings will be constructed near the HPAL process plant to support operational activities. These will include:

- administration and engineering offices
- change room(s) and first aid clinic
- workshop for fixed and mobile plant
- warehouse and spare parts building
- utilities buildings with sulphuric acid plant, power station and laboratory
- control building for the HPAL process plant
- chemical storage facilities.

Buildings will comply with Australian building standards and codes, including cyclone rating codes. Potable water will be produced onsite and reticulated. A package sewage treatment plant will be installed on site, and the treated effluent managed according to Queensland Government Guidelines.

3.12 STAFFING AND ACCOMMODATION

Accommodation facilities will be required for personnel during both the construction and operation phases of the Project. Operations staff is likely to be approximately 220 persons. They will be accommodated in residential housing and new flats to be built within the Greenvale Township. A construction camp and mess facilities will be sized and built to accommodate construction personnel during the 18 months construction period.

3.13 ENVIRONMENTALLY RELEVANT ACTIVITIES

Table 2 and Table 3 outline the proposed Environmentally Relevant Activities (ERA's) pursuant to the EP Act.

Nickel-cobalt ore and scandium oxide mining is addressed in Schedule 6 of the EP Act. The relevant annual fee for the Project is calculated based on the highest Aggregate Environmental Score.

Table 2 ERAs Associated with the Project

Environmentally Relevant Activity	Threshold	Aggregate Environmental Score
ERA 7 (d) – Chemical manufacturing	Inorganic chemical manufacturing - more than 100,000t	268
ERA 8 (1) (a) – Chemical Storage	50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 in containers of at least $10m^3$;	51
ERA 14 (2) (a) – Electricity Generation	Power station (fuel other than gas) with a rated capacity of 10 MW – 150 MW electrical	76
ERA 15 - Fuel Burning	Operation using equipment capable of burning > 500 kg / hour	35
ERA 17 – Abrasive Blasting	Abrasive blasting using a wet or dry pressure stream	16
ERA 20 (1) – Metal Recovery	Recovering metal by operating a scrap metal yard; < 100t metal per day	0

Environmentally Relevant Activity	Threshold	Aggregate Environmental Score
ERA 21 – Motor Vehicle Workshop Operation	Motor vehicle workshop	7
ERA 30 (c) – Metal Smelting and Refining	Processing metalloids or metals >100 to 10,000 t/yr	205
ERA 31 (2) (b) – Mineral Processing	Mineral processing of > 100,000 t/yr	280
ERA 33 - Crushing, Milling, Grinding or Screening	Crushing, milling, grinding or screening material: > 5,000 t/yr	0
ERA 43 – Concrete batching	Concrete batching of 200t or more per year	30
ERA 60 (1) (a) Waste Disposal	Operating a facility for disposing of less than 50,000t per year	50
ERA 63 (3) 2 (b) (ii) Sewage Treatment Plant	Treatment plant for 100 – 1,500 equivalent persons	53

Table 3 Mining Projects and their Aggregate Environmental Score

Item (Mining Activity)	Activity	Aggregate Environmental Score
Level 1 Mining Project	7. Mining nickel ore	160
Level 1 Mining Project	11. Mining metal ore (other)	158

3.14 NOTIFIABLE ACTIVITIES

The notifiable activities as per Schedule 3 of the EP Act that will be conducted on the Project site are presented in Table 4.

Table 4 Notifiable Activities Associated with the Project

Title of Activity	Description
1. Abrasive Blasting	Carrying out abrasive blast cleaning (other than cleaning carried out in fully enclosed booths) or disposing of abrasive blasting material.
6. Chemical Manufacture or Formulation	Manufacturing, blending, mixing or formulating chemicals if – (a) The chemicals are designated dangerous goods under the dangerous goods code; and (b) The facility used to manufacture, blend, mix, or formulate the chemicals has a design production capacity of more
7. Chemical Storage	Storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code
14. Engine Reconditioning Works	Carrying out engine reconditioning work at a place where more than 500 litres of any of the following are stored – (a) Halogenated and non-halogenated hydrocarbon solvents; (b) Dangerous goods in class 6.1 under the dangerous goods code; and (c) Industrial degreasing solutions
15. Explosives Production and Storage	Operating an explosives factory under the *Explosives Act 1999*
23. Metal Treatment or Coating	Treating or coating metal including anodising, galvanising, pickling, electroplating, heat treatment using cyanide compounds and spray painting using more than 5L of paint per week (other than spray painting within a fully enclosed booth)
24. Mine Wastes	(a) Storing hazardous mine or exploration wastes, including, for example, tailings dams, overburden or waste rock dumps containing hazardous contaminants; or (b) Exploring for, or mining or processing, minerals in a way that exposes faces, or releases groundwater, containing hazardous contaminants
25. Mineral Processing	Chemically or physically extracting or processing metalliferous ores
29. Petroleum Product or Oil Storage	Storing petroleum products or oil - (a) in underground tanks with more than 200 L capacity; or (b) in above ground tanks with: (i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code-more than 2,500 L capacity; or (ii) for petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code-more than 5,000 L capacity; or

Title of Activity	Description
	(iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS 1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia-more than 25, 000 L capacity
35. Smelting or Refining	Fusing or melting metalliferous metal or refining the metal

4.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

4.1 REGIONAL CLIMATE

Australian Bureau of Meteorology (BOM) rainfall stations in proximity to the Project area are identified in Table 5. A summary of rainfall records is given in Table 6. Rainfall is also recorded at Queensland Government stream gauging stations however these provide only limited data and do not add any information over and above the BOM records.

No rainfall summary data is provided for Station 032187 (Lake Lucy TM) due to the very short period of station record and limited data availability within that record.

The patterns of rainfall are similar at all stations with a mean annual average of 681 mm and a majority of rainfall occurring in the period from December to March. However there are extended periods with considerable variation above / below average rainfall conditions.

Table 5 Bureau of Meteorology Rainfall Stations

Station	Station Description	Year From	Years of Record	Latitude	Longitude	Elevation
30115	Lucky Springs Station	1968	41	19.06°S	144.96°E	457 m
30160	Greenvale Township	1912	94	19.00°S	144.98°E	500 m
32044	Valley of Lagoons	1872	120	18.66°S	145.10°E	490 m
32063	Blue Range	1953	53	19.16°S	145.42°E	384 m
32082	Craigs Pocket Station	1968	33	18.56°S	144.99°E	560 m
32085	Camel Creek Station	1941	62	18.84°S	145.47°E	450 m
32104	Christmas Ck Station	1888	38	19.09°S	145.35°E	380 m
32122	Greenvale	1890	82	18.98°S	145.11°E	427 m
32187	Lake Lucy TM	2002	1	18.51°S	145.19°E	400 m

Table 6 Summary of Monthly Average Rainfall

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
30115	184.6	161.3	87.8	37.3	22.9	14.5	9.8	8.8	8.1	19.4	51.3	94.5	701.3
30160	161.5	154.2	99.7	30.7	20	15.6	8.5	6.5	7.5	18	49.9	95.6	661.2
32044	152.5	140.8	105.2	31.4	19.4	18.4	10.4	8.2	8.8	19.2	50.2	97.5	670
32063	170.7	143.2	101.4	36.6	24.5	15.6	9.8	9.1	9.8	22.7	52	95	680
32082	177.4	166	102.8	39.7	30.1	14.3	9.4	8.9	8.3	17.6	67.8	108.8	763.8
32085	151.8	166.6	113.6	32.3	22.9	13.5	9	7.5	7.3	18.1	49.6	94.7	678.2
32104	153.8	149.5	83.2	42.7	24.1	15	11.4	10.2	8.7	18.5	61.5	86.3	657.1
32122	149.7	144.9	103.6	29.6	20.2	14.4	7.5	6.1	8.2	16	47.8	86.4	633.4

Mean maximum and minimum temperatures from the Charters Towers Airport Weather Station (BoM site number 034084; located approximately 180 km from the former Greenvale Nickel Mine and Lucknow and 200 km from Kokomo) are presented in Figure 6. The mean maximum temperature was 30.3°C and the mean minimum temperature was 17.6° C.

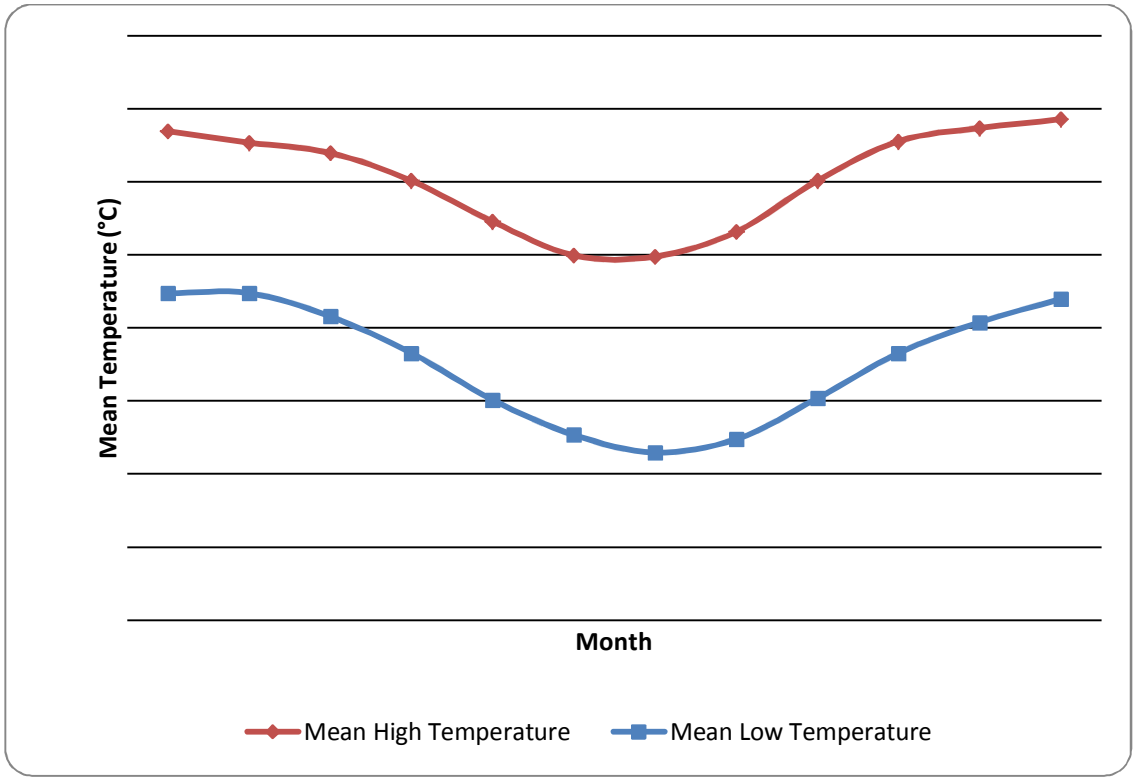


Figure 6 **Mean maximum and minimum temperatures by month from Charters Towers Airport Weather Station from 1992 to 2011**

4.2 LAND RESOURCES

4.2.1 Land Use

The current land use at the Project site consists of low intensity cattle grazing.

The former Greenvale Nickel Mine site has previously been mined and rehabilitated. Rehabilitation ranges from very good where rock mulching techniques have been used to poor where surfaces have not been sufficiently rehabilitated. There are sparsely to well-vegetated waste rock dumps and open pit voids holding ponded water. Lucknow and Kokomo are elevated and covered with open native vegetation.

4.2.2 Geology and Soils

Soil types associated with Greenvale and surrounding areas originate from erosion and deposition of deep lateritic, weathered ultramafic rocks. The soils comprise a range of sandy, red to yellowish-brown types according to their position in the landscape. Plateaus, mesas and valleys are dominated

by outcropping rock and sandy skeletal soils with ironbark (*Eucalyptus crebra*) dominated vegetation. The upper slopes are also skeletal and rocky but with isolated areas of deeper soils. The lower and gentler sloped areas are widespread and feature red and yellow podzols (Podosols) and solodized solonetz soils (Sodosols). On low-lying alluvial areas are the deeper and sandy red and yellow earths (Kandosols). All soil types are characterised by low fertility and plant water storage potential which significantly inhibits agricultural land suitability. They are utilised for broad scale grazing and have varying potential for improved pastures for grazing.

4.3 HYDROLOGY

4.3.1 Surface Water Resources

The former Greenvale Nickel Mine site contains existing flooded mining pits as the rehabilitation plan for the former mine makes provisions for an internally draining landform to capture eroded material in the former pits. The water in these pits meets Australia and New Zealand Environment Conservation Council 2000 (ANZECC) *Livestock Drinking Water Guidelines* and will need to be removed in order that mining can commence. The surface water flows are seasonal due to distinct wet/dry season. The Project site is situated in the Upper Burdekin River Basin. Most creeks are ephemeral and drain to the Burdekin River, which is located approximately 8 km downstream of the Project site. The Burdekin River flows all year although flows are highly seasonal.

Lucknow is located on a mesa. Surface water following rainfall rapidly drains from the cliffs of the mesa into local creeks. The creek system on the western and north-western side flows into Redbank Creek that also collects runoff from the southern parts of Greenvale. This water eventually flows into the Burdekin River. Water flowing from the eastern and southern sides of Lucknow MLA drains into the Gray River. The Gray River is ephemeral and eventually flows into the Burdekin River, approximately 17 km downstream of the Project site.

The Kokomo deposit is located on a ridgeline. Following rainfall, surface water rapidly drains from the ridge into local creeks that drain to the Burdekin River, located 1 km away.

MLM commenced baseline water sampling of the local creeks and rivers in November 2011 in order to collect wet season data.

4.3.2 Groundwater

On a regional level, drilling has confirmed the presence of limited groundwater mainly in low yielding discrete fractured zones. There are no water bores on the MLAs due to a lack of groundwater. There was no groundwater intercepted during any of the exploration drilling programs at Lucknow or Kokomo. Further groundwater investigation bores will be drilled as part of EIS baseline studies.

4.3.3 Wetlands

Both lacustrine and riverine water bodies have been identified in the upstream and downstream regional vicinity of the Project MLAs, however, no wetlands of National or International importance have been recorded on any of the Project MLAs, including those nominated under the Ramsar Convention. One wetland is listed in the Directory of Important Wetlands in Australia, Lake Lucy wetlands, which are located approximately 1 – 1.5 km east of the Project site (MLA 10342).

4.4 ECOLOGY

To gain an understanding of the potential occurrence of flora and fauna species within and adjacent to the Project site, database searches were undertaken via the Wildlife Online Database, Regional Ecosystem Description Database (REDD) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Database. These searches are described as follows and discussed in subsequent sections of this IAS:

- Wildlife Online Database – This database is administered by the Queensland Government and is derived from sources such as specimen collections, research and monitoring programs, literature records and wildlife permit returns. Species of conservation significance under the NC Act are listed in this database
- REDD – This database is administered by the Queensland Government and is a compilation of the information presented in Sattler and Williams (1999) and mapped by the Queensland Herbarium. It lists the status of regional ecosystems as gazetted under the *Vegetation Management Act 1999* (VM Act) and the Biodiversity Status as recognised by the Queensland Government
- EPBC Act Protected Matters Search Tool – This database is administered by the federal Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC). It generates a record of EPBC Act listed species that are predicted to occur in a given search area, general guidance on matters of national environmental significance and other matters protected by the EPBC Act (DSEWPAC 2011).

4.4.1 EPBC Threatened Ecological Communities

A desktop survey of threatened species and ecological communities listed under the EPBC Act was conducted for the Project sites in November 2011. The EPBC Act Protected Matters report was generated from a square 5 km x 5 km search area around each Project MLA centroid. The assessment identified no threatened ecological communities, various threatened fauna and flora species and migratory and marine listed fauna species potentially occurring within the Project site.

4.4.2 Flora

Table 7 presents the threatened Regional Ecosystems within the Project site and their status under the VM Act and Queensland Government Biodiversity Status. This information was generated using a central point for the each Project MLA and data extracted from the above databases. During terrestrial flora and fauna surveys to date, a small patch of Regional Ecosystem 9.3.4 was identified within the north western portion of Kokomo. This regional ecosystem is not located within the proposed mining disturbance area.

Table 7 Threatened Regional Ecosystems Identified within the Project Area

Regional Ecosystem ID	Description	VMA Status	Queensland Government Biodiversity Status
9.3.4	Permanent or seasonal wetlands frequently fringed by narrow bands of trees and shrubs including various mixes of *Melaleuca spp*. and *Eucalyptus spp*. on alluvial plains.	Of Concern	Of Concern
9.5.2	Semi-evergreen vine thicket on red kandosols on Tertiary plateaus	Of concern	Of concern
9.11.9	Semi-deciduous vine thicket on metamorphic soils (not limestone)	Of concern	Of concern

A summary of flora species of EPBC conservation significance that may occur on Greenvale and Lucknow is presented in Table 8 and for Kokomo in Table 9.

Note: that no flora species of conservation significance were recorded on the Project site.

Table 8 Flora Species of EPBC Conservation Significance that may occur on Greenvale and Lucknow MLAs

Botanical Name	Habitat	Conservation Status	
		EPBC Act	NCWR
Acacia jackesiana	Off Gregory Developmental Road. Serpentinized peridotite, pyroxenite, gabbro and amphipolite. Lateritic soils with *Eucalyptus crebra / Eucalyptus erythrophloia* grassy woodlands.	Not Listed	Near Threatened
Acacia ramiflora	This species is restricted to hills of the Great Dividing Range in Qld, in the Torrens Creek-Pentland area, and also in the Robertson R. area, near the headwaters of the Gilbert R., Qld. It grows in woodland on sandstone hills. A collection from Hughenden is from pebbly red earth in low open woodland of *Eucalyptus whitei* and *Triodia sp.*	Vulnerable	Vulnerable
Cajanus mareebensis	*Cajanus mareebensis* occurs in grassy woodlands of *Melaleuca-Acacia*, *Eucalyptus-Callitris* and *Eucalyptus-Corymbia* woodlands on sandy soils derived from granite with a lower horizon of impeded drainage. The Project site is located within the southern extent of this species' range (DSEWPAC, 2008).	Endangered	Endangered
Cycas platyphylla	The main population of *Cycas platyphylla* is known from the Petford district, west of the Atherton Tableland, Queensland. There are three smaller quite disjunct populations recorded from Taravale, Wandovale and the White Mountains, north of Torrens Creek. This species occurs in sparse *Eucalyptus sideroxylon* woodland with a grassy understorey, often on rocky slopes in shallow red stony loams (DSEWPAC, 2008a).	Vulnerable	Vulnerable

Table 9 Flora Species of EPBC Conservation Significance that may occur on Kokomo MLA

Botanical Name	Habitat	Conservation Status	
		EPBC Act	NCWR
Acacia ramiflora	This species is restricted to hills of the Great Dividing Range in Qld, in the Torrens Creek-Pentland area, and also in the Robertson River area, near the headwaters of the Gilbert River, Qld. It grows in woodland on sandstone hills. A collection from Hughenden is from pebbly red earth in low open woodland of *Eucalyptus whitei* and *Triodia sp.*	Vulnerable	Vulnerable
Cajanus mareebensis	*Cajanus mareebensis* occurs in grassy woodlands of *Melaleuca-Acacia*, *Eucalyptus-Callitris* and *Eucalyptus-Corymbia* woodlands on sandy soils derived from granite with a lower horizon of impeded drainage. The Project site is located within the southern extent of this species' range. Before 2002, it was known only from two sites but it has recently been located at a further eight sites near Musgrave on Cape York Peninsula; at three sites from the Irvinebank to Petford area; and at one site south-west of Mt Garnet (DSEWPAC, 2008).	Endangered	Endangered
Grevillea glossadenia	*Grevillea glossadenia* is endemic to north-east Queensland. It is found west of Atherton Tablelands, mainly between Walkamin, Irvinebank, Herberton, and Watsonville. Localities include Mount Emerald, Mount Misery, Cooloomon Creek, Little Cooloomon Creek, Emu Creek, Granite Creek, and Barkerville. This species grows in Eucalypt woodland or low open forest, in shallow to skeletal granitic soils on rolling hills, gravel terraces near stream beds and along roadsides and mining tracks (DSEWPAC, 2008b).	Vulnerable	Vulnerable

Botanical Name	Habitat	Conservation Status	
Phalaenopsis rosenstromii	*Phalaenopsis rosenstromii* occurs in north-east Queensland, sporadically from the Iron Range in the north and as far south as the Paluma Ranges. This species has been recorded in Daintree National Park, Iron Range National Park and Mt Spec National Park It is known to grow in trees, rarely on rocks, in humid airy situations on sheltered slopes and in gullies, in deep gorges and close to streams in rainforests, at altitudes from 200–500 m. Population numbers and extent of occurrence are unknown (DSEWPAC, 2008c).	Endangered	Endangered

Species and communities of conservation significance, identified in database searches, have been and will be further targeted during baseline flora and fauna surveys undertaken on the Project site. A technical report will be produced to identify flora conservation values for the Project site and provide mitigation strategies to combat potential impacts from Project activities.

4.4.3 Fauna

Table 10 and Table 11 present a summary of fauna species of EPBC Act or NC Act conservation significance, which may occur on the Project site. This information was sourced from the EPBC Act Protected Matters and Wildlife Online databases. Database searches were conducted using a central co-ordinate at each Project MLA.

Table 10 Fauna Species of Conservation Significance that may occur on Greenvale and Lucknow MLAs

Common Name	Scientific Name	Listing		Habitat
		EPBC	NCWR	
Red Goshawk	*Erythrotriorchis radiatus*	V	E	This bird of prey is distributed in coastal and sub-coastal North and North East Australia. Home ranges cover large areas of 50 to 220 square kilometres and ideally include a mix of vegetation types including open forests, open woodlands and woodlands, wetlands and rainforest edges with a preference of close proximity to rivers. Red Goshawks in North Queensland usually do not migrate. Nesting occurs in heavy forks of mature Eucalypt or Melaleuca in heights of 10-20 m, occasionally abandoned crows or magpie nests are utilised. The diet of the Red Goshawk includes mainly other birds but also smaller mammals, reptiles and insects are consumed.
Squatter Pigeon (southern)	*Geophaps scripta scripta*	V	V	The Squatter Pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts (DERM 2006). It has also been recorded in sown grasslands with scattered remnant trees, disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements, in scrub and acacia growth), and remains common in heavily-grazed country north of the Tropic of Capricorn (DERM 2006). The species is commonly observed in habitats that are located close to bodies of water (DERM 2006).
Star Finch (southern and eastern)	*Neochmia ruficauda ruficauda*	E	E	Inhabits tall grasses and reed beds associated with swamps and watercourses. However, habitat may vary according to season, and it may be found in mangroves, grassy woodlands and open forests. Distribution is poorly known. Recorded locations of observation are fragmented throughout central and coastal Queensland (QEPA, 2006a).

Common Name	Scientific Name	Listing		Habitat
Black-throated Finch (southern)	*Poephila cinta cinta*	E	E	The southern subspecies inhabits open woodland, scrubby plains, Pandanus flats with deep cover of grasses, never far from water
Australian Painted Snipe	*Rostratula australis*	V / Migratory Wetlands / Marine	V	The Australian Painted Snipe has been recorded at wetlands in all states of Australia. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia. It inhabits shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled, throughout many parts of Australia (DEWHA, 2007a).
Greater Large-eared Horseshoe Bat	*Rhinolophus philippinensis (large form)*	E	E	Inhabits rainforest, tropical eucalypt forest, melaleuca forest (Menkhorst and Knight, 2011).
Yakka Skink	*Egernia rugosa*	V	V	Usually found in open dry sclerophyll forest or woodland. Fallen timber and ground litter provide cover along with dense ground vegetation.
Fork-tailed Swift	*Apus pacificus*	Migratory Marine / Marine	NL	Habitat varies with a possible tendency to more arid areas. Under conditions of heat and high winds, can be seen in long straggling flocks numbering thousands. Also inhabits urban areas, particularly over coastlines (Simpson and Day, 2010).
Great Egret	*Ardea alba*	Migratory Marine / Migratory Wetlands / Marine	NL	The Great Egret is widespread throughout Australia, including Tasmania. It inhabits floodwaters, rivers, shallows of wetlands and intertidal mudflats (Simpson and Day, 2010).
Cattle Egret	*Ardea ibis*	Migratory Marine / Migratory Wetlands / Marine	NL	The Cattle Egret is widespread and common according to migration movements and breeding localities surveys. The Cattle Egret breeds in colonies, either mono-specific or with other Egrets/Herons. In Australia the principal breeding sites are the central east coast from about Newcastle to Bundaberg (DSEWPAC, 2010a). Inhabits pasture lands and shallows of freshwater wetlands.

Common Name	Scientific Name	Listing		Habitat
White-throated Needletail	*Hirundapus caudacutus*	Migratory Terrestrial / Marine	NL	The White-throated Needletail is widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (DSEWPAC, 2012).
Satin Flycatcher	*Myiagra cyanoleuca*	Migratory Terrestrial / Marine	NL	In Queensland, the Satin Flycatcher is widespread but scattered in the east, being recorded on passage on a few islands in the western Torres Strait. Satin Flycatchers. They are mainly recorded in eucalypt forests, especially wet sclerophyll forest, often dominated by eucalypts such as Brown Barrel, *Eucalypt fastigata*, Mountain Gum, *Eucalyptus dalrympleana*, Mountain Grey Gum, Narrow-leaved Peppermint, Messmate or Manna Gum, or occasionally Mountain Ash, *Eucalyptus regnans* (DSEWPAC, 2012b)
Latham's Snipe	*Gallinago hardwickii*	Migratory Wetlands / Marine	NL	Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia, travelling through northern Australia to reach non-breeding areas located further south). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies, as well as in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (DSEWPAC, 2012c).
Australian Cotton Pygmy-goose	*Nettapus coromandelianus albipennis*	Migratory Wetlands / Marine	NL	Inhabits freshwater lakes, lagoons, swamps and dams, particularly those vegetated with waterlilies and other floating or submerged aquatic vegetation throughout coastal QLD and NSW (Simpson and Day, 2010).
Magpie Goose	*Anseranas semipalmata*	Marine	NL	The Magpie Goose inhabits northern Australia, including eastern Queensland and north ends of West Australia and Northern Territory. It occurs in rush and sedge-dominated swamps, as well as floodplains and rice crops (Simpson and Day, 2010).

Table 11 Fauna Species of Conservation Significance that may occur on Kokomo MLA

Common Name	Scientific Name	Listing		Habitat
		EPBC	NCWR	
Red Goshawk	*Erythrotriorchis radiatus*	V	E	Prefers a mix of vegetation types including tall open forest, woodland, lightly treed savannah and rainforest edges. Found over eastern QLD, northern Australia and there are also confirmed sightings from central Australia (QEPA, 2005).
Squatter Pigeon (southern)	*Geophaps scripta scripta*	V	V	The Squatter Pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts (DERM 2006). It has also been recorded in sown grasslands with scattered remnant trees, disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements, in scrub and acacia growth), and remains common in heavily-grazed country north of the Tropic of Capricorn (DERM 2006). The species is commonly observed in habitats that are located close to bodies of water (DERM 2006).
Star Finch (southern and eastern)	*Neochmia ruficauda ruficauda*	E	E	Inhabits tall grasses and reed beds associated with swamps and watercourses. However, habitat may vary according to season, and it may be found in mangroves, grassy woodlands and open forests. Distribution is poorly known. Recorded locations of observation are fragmented throughout central and coastal Queensland (QEPA, 2006a).
Black-throated Finch (southern)	*Poephila cinta cinta*	E	E	The southern subspecies inhabits open woodland, scrubby plains, Pandanus flats with deep cover of grasses, never far from water.

Common Name	Scientific Name	Listing		Habitat
Australian Painted Snipe	*Rostratula australis*	V / Migratory Wetlands / Marine	V	Inhabits shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled, throughout many parts of Australia (DEWHA, 2007a)
Greater Large-eared Horseshoe Bat	*Rhinolophus philippinensis (large form)*	E	E	Inhabits rainforest, tropical eucalypt forest, melaleuca forest (Menkhorst and Knight 2001). Based on the area of national parks where the species has been recorded, the minimum area of occupancy is 8159 km².
Northern Quoll	*Dasyurus hallucatus*	E	E	The Queensland population of the Northern Quoll is highly fragmented, with severe reductions from the species' former distribution. The Northern Quoll is known to occur as far south as Gracemere and Mt Morgan, south of Rockhampton, as far north as Cooktown in Queensland, generally within 150 km of the coast. It occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal (DSEWPAC, 2012e).
Yakka Skink	*Egernia rugosa*	V	V	Found throughout coastal and south-east Queensland in dry open forests, woodlands and rocky areas. The Yakka Skink's distribution is highly fragmented as a large proportion of potential habitat for the species has been cleared throughout the species' range (Wilson, 2005).
Fork-tailed Swift	*Apus pacificus*	Migratory Marine / Marine	NL	Habitat varies with a possible tendency to more arid areas. Under conditions of heat and high winds, can be seen in long straggling flocks numbering thousands. Also inhabits urban areas, particularly over coastlines (Simpson and Day, 2010).

Common Name	Scientific Name	Listing		Habitat
White-bellied Sea-eagle	*Haliaeetus leucogaster*	Migratory Terrestrial, Marine	NL	This species is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. Breeding records are patchily distributed, mainly along the coastline, and especially the eastern coast, extending from Queensland to Victoria, and to Tasmania. The habitats are characterised by the presence of large areas of open water (larger rivers, swamps, lakes and sea) (DSEWPAC, 2010b).
Rainbow Bee-eater	*Merops ornatus*	Migratory Terrestrial, Marine	NL	The Rainbow Bee-eater is distributed across much of mainland Australia. It occurs mainly in open forests and woodlands, shrub lands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water, as well as in inland and coastal sand dune systems, in mangroves in northern Australia, in various other habitat types including heathland, sedge land, vine forest and vine thicket (DSEWPAC, 2012a).
Great Egret	*Ardea alba*	Migratory Marine / Migratory Wetlands / Marine	NL	The Great Egret is widespread throughout Australia, including Tasmania. It inhabits floodwaters, rivers, shallows of wetlands and intertidal mudflats (Simpson and Day, 2010).
White-throated Needletail	*Hirundapus caudacutus*	Migratory Terrestrial / Marine	NL	The White-throated Needletail is widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (DSEWPAC, 2012).

Common Name	Scientific Name	Listing		Habitat
Satin Flycatcher	*Myiagra cyanoleuca*	Migratory Terrestrial / Marine	NL	In Queensland, the Satin Flycatcher is widespread but scattered in the east, being recorded on passage on a few islands in the western Torres Strait. Satin Flycatchers. They are mainly recorded in eucalypt forests, especially wet sclerophyll forest, often dominated by eucalypts such as Brown Barrel, *Eucalypt fastigata*, Mountain Gum, *Eucalyptus dalrympleana*, Mountain Grey Gum, Narrow-leaved Peppermint, Messmate or Manna Gum, or occasionally Mountain Ash, *Eucalyptus regnans* (DSEWPAC, 2012b)
Latham's Snipe	*Gallinago hardwickii*	Migratory Wetlands / Marine	NL	Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia, travelling through northern Australia to reach non-breeding areas located further south). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies, as well as in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (DSEWPAC, 2012c).
Australian Cotton Pygmy-goose	*Nettapus coromandelianus albipennis*	Migratory Wetlands / Marine	NL	Inhabits freshwater lakes, lagoons, swamps and dams, particularly those vegetated with waterlilies and other floating or submerged aquatic vegetation throughout coastal QLD and NSW (Simpson and Day, 2010).
Magpie Goose	*Anseranas semipalmata*	Marine	NL	The Magpie Goose inhabits northern Australia, including eastern Queensland and north ends of West Australia and Northern Territory. It occurs in rush and sedge-dominated swamps, as well as floodplains and rice crops (Simpson and Day, 2010).

4.4.4 Environmentally Sensitive Areas

The Environmentally Sensitive Area (ESA) mapping developed by the Queensland Government shows no Category A, B, or C ESAs on the Project site, however it shows two wetlands associated with the Burdekin River between 1 – 1.5 km east of MLA 10342 (Figure 9). These wetlands are listed in the Directory of Important Wetlands in Australia managed by DSEWPAC. The Directory aims to prevent further loss of wetland habitat by developing a better understanding of their values and location. Figure 7 - Figure 9 presents the ESAs which surround the Project site.

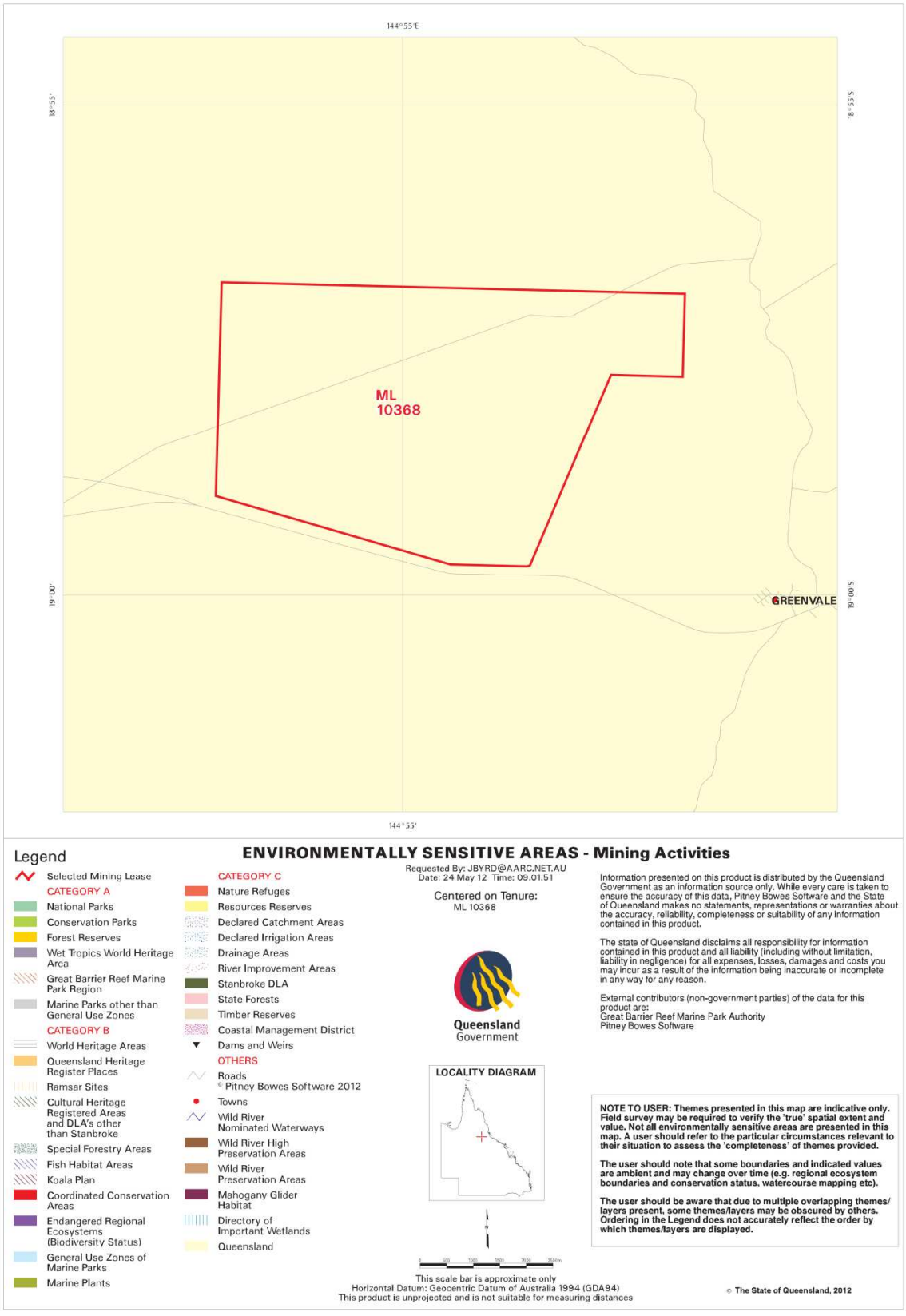


Figure 7 Environmentally Sensitive Areas on MLA 10368 (Greenvale)

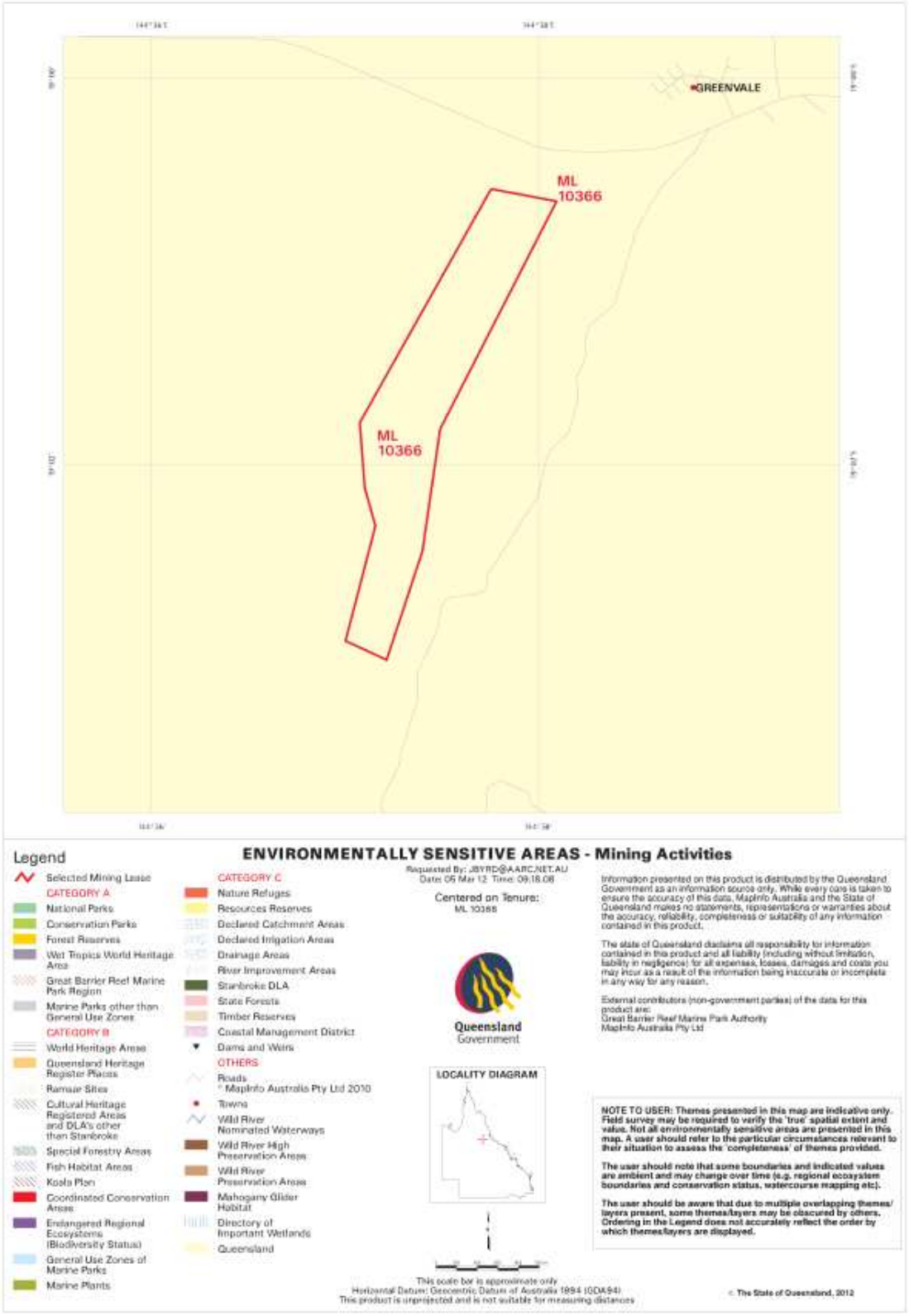


Figure 8 Environmentally Sensitive Areas on MLA 10366 (Lucknow)

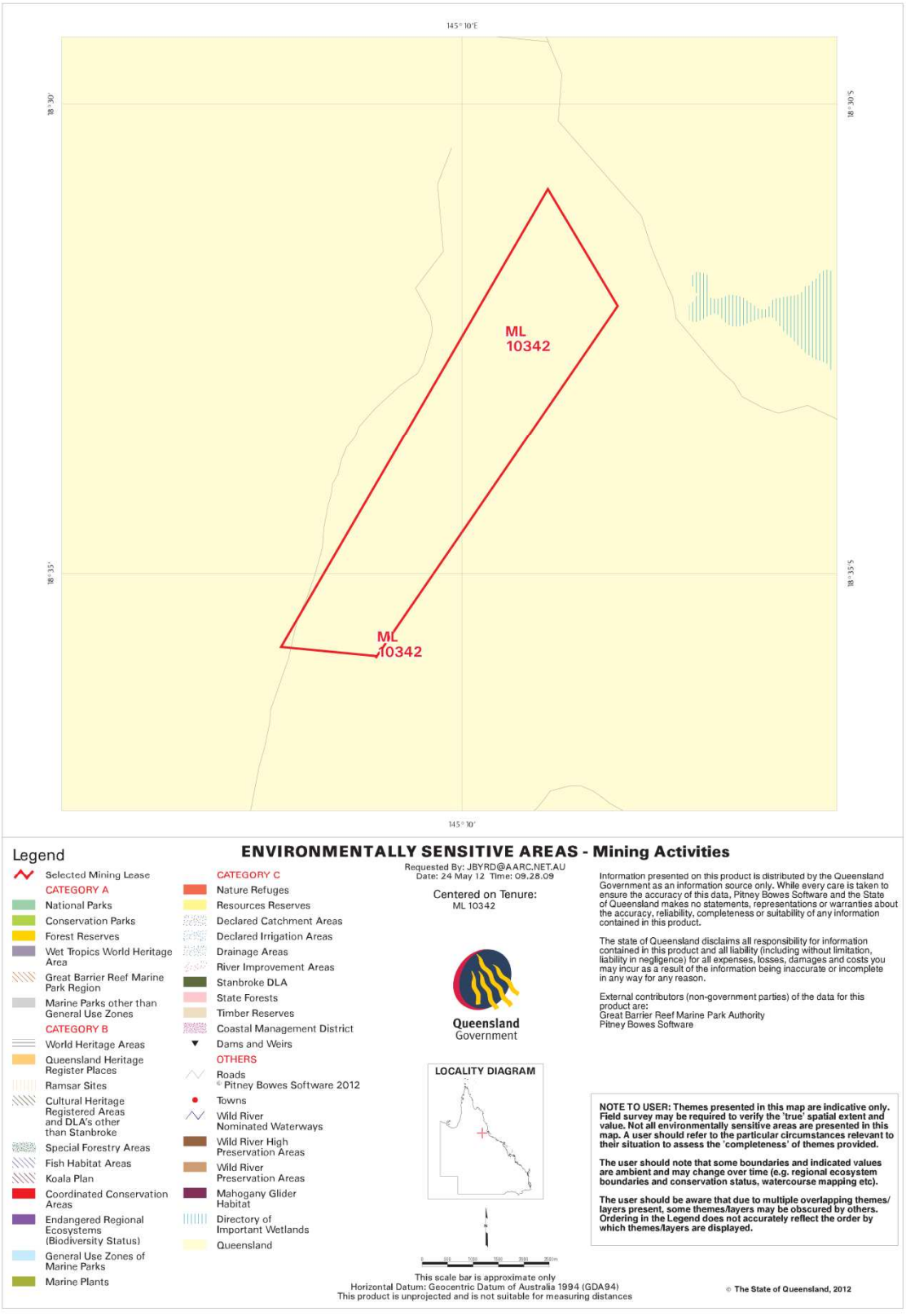


Figure 9 Environmentally Sensitive Areas on MLA 10342 (Kokomo)

4.5 EPBC ACT REFERRAL

The Project has been referred to DSEWPAC to determine whether it constitutes a controlled action under the Commonwealth's EPBC Act 1999. The DSEWPAC (20th June 2012) have determined the Project is NOT a controlled action.

4.6 TRAFFIC AND TRANSPORT

A traffic and transport assessment will be conducted for the Project to identify the product, materials and staff transport routes required. The study will identify any significant impacts that the Project may have upon local and regional transport systems and present potential transport management options to address these impacts.

4.7 SOCIO-ECONOMIC CONDITIONS

The Project site is located in a rural area, in the vicinity of the Greenvale Township, 205 km northwest of Charters Towers. The Charters Towers Regional Council is responsible for local government services in the Project area. The township has about 150 residents. There are basic shops and services, a local primary school, part time serviced police station, State Emergency Service, hotel and BP Service Station. A gravel airstrip is adjacent to the town and can be used by light aircraft. The local employment comprises cattle grazing related work and small businesses servicing the community.

The total number of persons that will be employed by the mine during operations will be approximately 220 with approximately 500 persons during construction. The Project will bring social changes and it is anticipated that the local and regional district would economically benefit from the Project.

4.8 CONSERVATION ESTATES

There are no National Parks or World Heritage Areas in the area surrounding the town of Greenvale or within the Project site. The Project may impact on marine parks and downstream environmental values such as the Great Barrier Reef Marine Park and downstream water users through the accidental release of contaminants to waterways. Figure 9 shows the Valley of Lagoons Nature Reserve located 8 km east of Kokomo.

4.9 CULTURAL HERITAGE

4.9.1 Indigenous

The traditional owners of the regional area are the Gugu Badhun People (Gugu Badhun). MLM has been working closely with the Gugu Badhun, resulting in MLM and the Gugu Badhun having an Indigenous Land Use Agreement (ILUA) for exploration activities in place that was finalised in February 2005. The Gugu Badhun have been contracted to undertake heritage clearances of all exploration sites for MLM prior to exploration work. These surveys have been documented and the Gugu Badhun have signed off and allowed exploration to be conducted across MLA 10366.

The cultural heritage work program has a primary aim to identify, record and assess the potential positive and negative impacts the Project may have on local cultural heritage values for inclusion in the EIS. This baseline work should also provide a record of the heritage values for the Guru Badhun and enable MLM to implement a practical Cultural Heritage Management Plan in partnership with the Gugu Badhun and community as the Project develops.

All activities will be undertaken with due consideration to the Duty of Care Guidelines prescribed under the *Aboriginal Cultural Heritage Act 2003*.

4.9.2 Non-Indigenous Heritage

There are no heritage listed places on the Queensland Heritage Register for the Project site. There are no Commonwealth Heritage Places listed on the Australian Heritage Database for the Project site.

4.10 AIR QUALITY

Air quality in the Project area is mainly influenced by pastoral activities, local bushfires, effects from cattle grazing and road transportation.

4.11 NOISE

There is no major industry in the immediate vicinity of the Project site. Local noise is generated by pastoral activities and local heavy transportation travelling along the Gregory Developmental Road.

4.12 NATURAL ENVIRONMENTAL HAZARDS

4.12.1 Bushfire Prone Areas

The bushfire season for the Project site is spring. The Queensland Fire and Rescue Service (2008) shows that there are areas on the Project site with a low to medium bushfire risk, but no high bushfire risk.

4.12.2 Cyclonic Influence

The coastal area to the east of the Project site experiences an average of 0.2 cyclones per year (Bureau of Meteorology 2010). However, as the Project site is located approximately 150 km from the coastline, the potential for severe cyclonic damage is low. All buildings and infrastructure will be designed to Australian building standards and codes to meet wind shear guidelines for the area.

5.0 POTENTIAL ENVIRONMENTAL IMPACTS

5.1 LAND SYSTEMS

Land tenure will change from background General Pastoral Land (GPL) or EPM to ML over the life of the Project to allow for mining.

At Greenvale the main impacts will occur on the previously disturbed areas of the former Greenvale Nickel Mine. The impacts will include:

- development of an HPAL process plant and power station (on the former Greenvale Nickel Mine)
- mining of ore (within the former Greenvale Nickel Mine), and stockpile areas
- open cut pits
- waste rock dumps and overburden (to be contained within the former Greenvale Nickel Mine)
- RSF and small evaporation ponds
- a raw water dam and sediment control dams
- pipeline corridors for raw and recycled water lines
- new access roads.

At Lucknow and Kokomo the impacts will include:

- open cut pits
- starter waste dumps
- sediment control dams
- access roads.

The soils and rocks are highly oxidised and lateritic. They are non-acid forming as they contain negligible sulphide concentrations. Potential impacts will occur during mining and civil works, as fine material can be mobilised following rainfall or as dust in dry conditions. Dust suppression and sediment catchment structures will be built to minimise offsite impacts.

During Project construction, the majority of physical impacts upon the Project area will arise as a result of road use and bulk earthwork movements. The final landforms will be designed to meet long term stability factors and support native vegetation. There is an opportunity to improve the existing poorly rehabilitated areas on the former Greenvale Nickel Mine site. Construction impacts will be managed through an appropriate Construction Environmental Management Plan.

Waste rock dumps will be reshaped, rock mulched, topsoiled and progressively revegetated. As the mine develops, dump sites and other areas will be progressively rehabilitated, in order to minimise the total land area disturbed by the operation at any one time.

Land use impacts will be limited to those areas directly affected by the mining operations. The EIS will describe the degree to which the operation will affect land use capability, including plans for rehabilitation and decommissioning.

5.2 BIOLOGICAL IMPACTS

At Greenvale regrowth vegetation and some remnant vegetation will be cleared for the RSF, small evaporation and sediment catchment ponds and the proposed raw water dam.

Much of the mine site has already been cleared of remnant vegetation due to previous mining activities and is used for cattle grazing; however a detailed flora and fauna assessment will be completed as part of the EIS process.

At Lucknow and Kokomo, remnant vegetation will be cleared to allow for open cut mining. The mining schedule allows for sequential mining of the pits and placement of waste back into older pits for progressive rehabilitation.

No planned discharges of mine-affected water are proposed under the Project. Impacts on the Burdekin River or ephemeral streams as the mine will operate may occur for any unplanned releases.

The former Greenvale Nickel Mine provides information on the biodiversity status after 20 years of rehabilitation. Successful rehabilitation methods and areas for improvement will be identified through studies with the University of Queensland, Centre for Mined Land Reclamation.

5.3 WATER SUPPLY AND QUALITY

The Project will require raw water for processing; therefore, a licence to extract water from the Burdekin River will be applied for. As part of the application an assessment of river flows and downstream impacts will be completed, as well as aquatic impacts.

Harvesting of runoff water during the wet season is an option to collect and store in an onsite dam. The impact for this facility will be assessed as part of the EIS.

The potential for ground water contamination is low due to the lack of contiguous groundwater in the region. The area is a mineralised zone. Groundwater investigations will determine the baseline conditions and predict long term impacts. Chemical and processing spills will be contained through bunding and recovery.

Contaminated water from mining or sediment control structures will be identified and retained on site for treatment, recycling or disposal through evaporation dams.

Onsite surface water runoff is likely to carry elevated sediment levels from hardstand and construction works. Where roads are required to cross waterways, creek crossings will be designed to withstand projected flood events and erosion. Sediment control structures with pump-back systems will be installed.

Further hydrological and groundwater studies will be conducted to understand the surface water and groundwater quality and potential volumes to be managed. A Water Management Plan will be developed to manage raw water and discuss any re-use, recycling and disposal options.

5.4 AIR QUALITY

The proposed HPAL process plant has the potential to impact the local air shed. During construction, considerable earthworks will be required for new roads, mining pre-stripping, construction of RSF, evaporation ponds and a potential raw water dam. The disturbance and vehicular movements will increase dust generation and impact on air quality. Dust will be managed during construction by implementing a Construction EM plan and will be controlled using appropriate dust suppression and control techniques.

Dust deposition gauges will be installed on the Project site, in order to collect background levels representative of Project area prior to construction. Air quality modelling will be undertaken to predict the impact of dust levels and emissions on the environmental values during Project construction and operation.

Dust from mining operations could be a potential impact on downwind receptors. Mining dust control measures will be implemented as part of the Mining Plan.

The proposed HPAL process plant has the potential to impact on the local airshed by emitting:

- sulphur oxide species
- nitrogen oxide species
- carbon monoxide
- carbon dioxide
- hydrogen sulphide
- ammonia species
- steam.

The largest potential source for emissions will be the sulphuric acid plant, which will include a stack to release its emissions. Appropriate emission control measures will be implemented to minimise any fugitive and point source emissions.

Potential impacts from the HPAL process plant and the sulphuric acid plant will be identified in the EIS and managed through an Environmental Management Plan (EM plan). It is anticipated that the Project will trigger National Greenhouse and Energy Reporting (NGER) annual reporting when operational.

5.5 NOISE AND VIBRATION

The proposed HPAL process plant will increase background noise levels during construction and operation. The plant design will incorporate engineered noise suppression to meet appropriate standards. During construction there will be increased vehicular movements, excavations and steel work fabrication. The works have the potential to increase noise levels.

The nearest sensitive receptors are located at Greenvale Township approximately 8 km to the southeast of the proposed plant.

Baseline noise monitoring will be conducted as part of the EIS and used for predictive noise modelling. Noise levels from the Project, and the potential impact on sensitive receptors, will be predicted based on the proposed Mine Plan.

The potential for vibration impacts during construction will depend on any civil works that may require specific blasting to break hard rock. Due to the soft nature of the laterite ores, mining will predominately consist of free digging. Minor blasting may be required on harder material or ironstone caps. Blasting will be managed in the Mine Plan and include appropriate blast design.

5.6 VISUAL AMENITY

The preferred location for the HPAL process plant is located 3 km from the Gregory Development Road and shielded by a natural 50 m high ridgeline on the eastern side. This will shield the plant from Greenvale Township, approximately 8 km to the east. A number of natural topographic highs and mature vegetation buffers will shield the Project site from potentially sensitive receptors. The potential visual impacts will be assessed in the EIS.

5.7 WASTE MANAGEMENT

The major waste streams that will be generated from the Project include:

- processing residue from the HPAL process plant
- waste rock
- construction waste
- operation's general waste.

Preliminary studies for potential containment of residue in the RSF and the evaporation ponds have been completed by GHD consultants. Six locations at Greenvale were assessed. The preferred locations are immediately west of the former Greenvale Nickel Mine. The preliminary designs will contain 20 years of processing residue in a multi cell engineered RSF. The final design will meet Australian National Committee on Large Dams and Queensland Government Hazardous Dam requirements. The impacts of these structures include clearing of sparse vegetation and cut/fill levelling for dam foundations.

The exact locations have not been finalised pending geotechnical and survey investigations to be completed after the 2012 wet season. The final containment site will be incorporated into the EIS assessment process and impacts identified. Earthwork and sediment impacts associated with RSF construction will be addressed in the EIS.

Waste rock is anticipated to be relatively benign as there are no sulphides in the waste rock or ore. Monitoring of runoff and seepage water from the former Greenvale Nickel Mine waste rock dumps indicates the water meets ANZECC Cattle Watering Guidelines. The Mine Plan will identify suitable areas for waste rock dump construction. It is anticipated that waste rock dumps can be contained within the former Greenvale Nickel Mine disturbance footprint. Dumps will be engineered to meet stability guidelines and rehabilitated.

Wastes likely to be generated during the construction phase of the Project include green waste, concrete materials, timber, metals, hydrocarbons, sewage, exhaust emissions, tyres and paint

materials. Wastes likely to be produced during the operation phase include green waste, batteries, scrap metal, tyres, water treatment plant waste, residual wastes and other general waste.

Construction and operations waste will be segregated. A recycling centre will be established to send recyclable materials to Townsville. Waste that cannot be recycled will be sent to a registered landfill.

5.8 TRANSPORT IMPACTS

The Project will increase road traffic between Townsville and the Project site during the construction and operation phases of the Project. A transport impact assessment will be conducted during the EIS process, in consultation with Queensland Transport and the Queensland Department of Transport and Main Roads. Increased traffic and road upgrades will be required when developing the Kokomo deposits. Ore will be trucked to Greenvale for processing during the dry season.

5.9 INDIGENOUS AND NON-INDIGENOUS CULTURAL HERITAGE

The Gugu Badhun are the recognised traditional owners on the Project site. MLM has a recognised exploration ILUA and have negotiated a project ILUA, which is getting ratified. Previous cultural studies have identified and documented the Gugu Badhun cultural sites in the region. Specific studies in consultation with the Gugu Badhun will be completed across the MLA's to review previous studies and also focus on potential high impact areas.

No items of European cultural heritage are likely to be present on the site, however a cultural heritage investigation as part of the EIS will be undertaken. Findings and management of cultural heritage aspects will be developed as part of a Cultural Heritage Management Plan.

5.10 SOCIO-ECONOMIC

Approximately 70% of nickel supply goes into stainless steel production which is a "quality of life" material that is highly recyclable and widely used in environmental, medical and life applications. Cobalt is predominately used in batteries and with an increase in hybrid low emission vehicles the demand for cobalt should remain steady. There is the potential of commercially minable scandium to supply the global market, which could see MLM become a leading producer of scandium on a global scale. Scandium will also impact on "quality of life".

Socio-economic benefits of the Project will occur at local, regional and state level and include direct and indirect flow-on effects. The potential benefits will include:

- construction of HPAL process plant and facilities resulting in over 500 jobs at height of construction
- increased trade to local service, hospitality and building supply industries
- at operations creation of approximately 220 full time jobs
- additional indirect jobs-upstream and downstream (3x multiplier) approximately 660
- annual operations expenditure into local region of approximately $100 million dollars.

The export of 7000 tpa of Ni-Co and 40-120 tpa scandium will generate export revenue for Australia and royalties for Queensland.

Development of the Project will have both opportunities and impacts on the residents in Greenvale and the surrounding district including local property owners. Impacts will include town development to support the new mine. This will bring in social services that are not currently available including banking, improved health & education and policing. It is expected there will an increase in small business opportunities to service the increased population. The establishment of new shops and a supermarket should bring extra shopping variety to Greenvale. Development should increase land and house values. This will most likely increase short term rental market demand until NORNICO builds residential and workers accommodation.

It is anticipated the construction workforce will consist of residents from local townships and regional centres, and workers brought in from elsewhere, based on their relevant experience. Operational staff will be encouraged to live locally. Preference will be given to training local residents.

Impacts and opportunities associated with the Project will be identified in the EIS.

6.0 COMMUNITY CONSULTATION

6.1 INTERESTED PERSONS

The definition of interested persons has been taken from the former Department of Environment and Resource Management (DERM) *Guideline – The Environmental Impact Statement (EIS) Process for Level 1 Mining Projects.*

"Interested persons may include a local community progress association, a local/state/national environmental action group, or affected land users other than landholders".

Interested persons for the Project may include, but not be limited to, the following groups as stated in Table 12 below.

Table 12 Interested Persons

Name of Interested Person or Organisation	Address	Relationship to the Project
Department of Environment and Heritage Protection (EHP)	187-209 Stanley Street Townsville, Qld 4810	Government agency which administers sustainable resource use
Department of Natural Resources and Mines (NRM)	187-209 Stanley Street Townsville, Qld 4810	Government agency which is responsible for mines
Department of State Development, Infrastructure and Planning (DSDIP)	187-209 Stanley Street Townsville, Qld 4810 PO Box 1752 Townsville, Qld 4810	Government agency which is responsible for local planning
Department of Transport and Main Roads	146 Wills Street Townsville, Qld 4814 PO Box 7466 Garbutt BC, Qld 4814	Government agency which is responsible for roads
Ergon Energy	PO Box 1090 Townsville, Qld 4810	Potential service provider of electricity
Telstra Corporation	Queensland Region 21/275 George St, Brisbane, Qld 4000	Potential service provider of telecommunications
Port of Townsville	1 Benwell Road Townsville, Qld 4810 PO Box 1031 Townsville, Qld 4810	Potential service provider of product shipping / transport

Name of Interested Person or Organisation	Address	Relationship to the Project
Charters Towers Regional Council	12 Mossman Street Charters Towers, Qld 4820 PO Box 189 Charters Towers, Qld 4820	Potential service provider of water
Charters Towers Chamber of Commerce and Mines	PO Box 595 Charters Towers, Qld 4820	An elected committee with an interest in the Charters Towers region
Queensland Fire and Rescue (Northern Region)	204 Gill Street Charters Towers, Qld 4820 2-8 Morey Street Townsville, Qld 4810	Regional emergency service provider
Greenvale Rural Fire Brigade	Greenvale, Qld 4816	Local community emergency service provider
A1 Flying Doctor Service / Greenvale Local Ambulance Committee	Redbank Drive Greenvale, Qld 4816	Local community emergency service provider
Greenvale Police Station	1 Cassa Court Greenvale, Qld 4816	Local community emergency and safety service provider
Greenvale Progress Association Helga Phillips (secretary)	RTC 2 Acacia Drive Greenvale, Qld 4816	Local community development group
Greenvale Country Club	Redbank Drive Greenvale, Qld 4816	Local community service
Greenvale Caravan Park	Kylee Court Greenvale, Qld 4816	Local community service
Three Rivers Hotel	Redbank Drive Greenvale, Qld 4816	Local community service
Greenvale Carriers, Store and Hardware	Redbank Drive Greenvale, Qld 4816	Local community service
Greenvale Roadhouse and Fuel Supplies	Redbank Drive Greenvale, Qld 4816	Local community service
Greenvale Library	Cnr Redbank Drive and Acacia Drive Greenvale, Qld 4816	Local community service
Shane Knuth, MP	State Member for Dalrymple Office Stock Exchange Arcade 2/76 Mossman Street, Charters Towers	State member

6.2 AFFECTED PERSONS

The definition of an affected person is provided in section 38 of the *Environmental Protection Act 1994*.

A person is an "affected person" for a project if the person is:

(1) A person is an "affected person" for a project if the person is:

a) a person mentioned in subsection (2) for the operational land or any land joining it; or

b) any of the following under the Native Title Act 1993 (Commonwealth) for the operational land or for an area that includes any of the land

i. a registered native title body corporate;

ii. a registered native title claimant;

iii. a representative Aboriginal/Torres Strait Islander body; or

iv. a relevant local government for the operational land.

(2) a person mentioned below for the operational land or any land joining it:

a) for freehold land - a registered proprietor;

b) for land that is held from the State for an estate or interest less than fee simple and for which the interest is recorded in a register mentioned in the Land Act 1994 (Land Act),section 276 – a person recorded in the register as the registered holder of the interest;

c) for land subject to a mining claim, mineral development licence or mining lease - a holder of, or an applicant for, the tenement;

d) for land subject to an authority to prospect or a lease or licence under the Petroleum Act 1923 –

i. a holder of the authority; or

ii. a lessee under the lease; or

iii. a licensee under the licence;

e) for land under the Land Act or the Nature Conservation Act 1992 (NCA) for which there are trustees - a trustee of the land;

f) for Aboriginal land under the Aboriginal Land Act 1991 (ALA) that is taken to be a reserve because of section 87(2) or 87(4)(b) of that Act - a grantee of the land;

g) for DOGIT land under the ALA or the Torres Strait Islander Land Act 1991 - a trustee for the land;

h) for land held under a lease under the Local Government (Aboriginal Lands) Act 1978,section 6 - a relevant local government;

i) for Torres Strait Islander land under the Torres Strait Islander Land Act 1991 that is taken to be a reserve because of section 84(2) or 84(4)(b) of that Act - a grantee of the land;

j) for land under a lease from the State under the Aborigines and Torres Strait Islanders (Land Holding) Act 1985 that has been excised from land granted in trust for Aboriginal or Torres Strait Islander purposes under the Land Act - a trustee of the land;

k) for land that is any of the following, the State -

i. unallocated State land;

ii. a reserve under the Land Act for which there is no trustee;

iii. a national park, national park (Aboriginal land), national park (scientific), national park (Torres Strait Islander land), national park (recovery) or forest reserve under the NCA;

iv. a conservation park under the NCA for which there are no trustees;

v. a State forest or timber reserve under the Forestry Act 1959;

vi. a State-controlled road under the Transport Infrastructure Act 1994;

vii. a fish habitat area under the Fisheries Act 1994; or

l) another person prescribed under a regulation to the EP Act.

Affected Persons for the Project are shown in Table 13 below.

Table 13 Affected Persons List

Owner/Holder/Trustee	Address	Property Description	Tenure
Charters Towers Regional Council	12 Mossman Street Charters Towers, Qld 4820 PO Box 189 Charters Towers, Qld 4820	Region	Local Government Authority
Charters Towers Regional Council	PO Box 189 Charters Towers, Qld 4820	21 SP 185817	Freehold land adjacent to the Gregory Developmental Road between Greenvale and Lucknow MLAs
Gugu Badhun Ltd	Dale Gertz (Chairman) PO Box 1377 Aitkenvale, Qld 4814	Project Site	Aboriginal Cultural Heritage Body
Warrungu Aboriginal Corporation	Camilla Smith PO Box 702 Castletown Hyde Park, Qld 4814	Project Site	Aboriginal Cultural Heritage Body

Owner/Holder/Trustee	Address	Property Description	Tenure
Department of Transport and Main Roads	146 Wills Street Townsville, Qld 4814 PO Box 7466 Garbutt BC, Qld 4814	Gregory Developmental Road / Lava Plains – Mt Fox Road	Gazetted Road
North Queensland Land Council	61 Anderson Street Cairns, Qld 4870 PO Box 679 N Cairns, Qld 4870	Project Site	Aboriginal Representative group over the Project area
Greenvale Silicon Pty Ltd	Lot 3 Mount Fox Road Greenvale, Qld 4816	ML 10289	Principal holder of mining lease adjacent to Greenvale MLA
Copper Strike Limited	Level 9 356 Collins Street Melbourne, Vic 3000	EPM 18877	Principal holder of exploration permit underlying the Greenvale MLA
Transitional Securities Group Pty Ltd – Sunseeker Minerals Pty Ltd	Suite 1 GF 437 Roberts Road Subiaco, WA 6008	EPM 18368	Principal holder of exploration permit adjacent to the Greenvale MLA
Jacqueline Olga Core Health as TTE	'Lucky Springs Station' MS2 Charters Towers, Qld 4820	1 CLK40	Leasehold under Lucknow MLA
Henry James and Susan Atkinson	'Lucky Downs Station' Post Office Greenvale, Qld 4816	501 SP232789	Leasehold under Greenvale MLA and Greenvale – Kokomo Access Road
Judith Elizabeth and Thomas Patrick Sheahan	'Valley of Lagoons Station' MS 102 2602 Abergowrie Road Ingham, Qld 4850	4 SP232791	Leasehold under Kokomo MLA and Greenvale – Kokomo Access Road
Ergon Energy Corporation Limited Mr Karl Kepper	PO Box 1090 Townsville, Qld 4810	500 SP112185	Leasehold under the Greenvale MLA
Department of Natural Resources and Water	State Land Asset Management PO Box 5318 Townsville, Qld 4810	2 USL48011	State land adjacent to the Gregory Developmental Road between Greenvale and Lucknow MLAs
Gerhard Herbert Hahle and Marion Elizabeth Orson	PO Box 31 Greenvale, Qld 4816	1 SP103591	Freehold land adjacent to the Gregory Developmental Road between Greenvale and Lucknow MLAs

Owner/Holder/Trustee	Address	Property Description	Tenure
SJ Jones Pty Ltd	PO Box 134 Mount Garnet, Qld 4872	59 SP103591	Freehold land adjacent to the Gregory Developmental Road between Greenvale and Lucknow MLAs
Matthew Stuart Vote	32 Bernacchi Street Mawson, Act 2607	10 CLK24	Leasehold land adjacent to the Gregory Developmental Road between Greenvale and Lucknow MLAs
Queensland Rail Limited	C/o Facilities Administration PO Box 1102 Townsville, Qld 4810	1 SP116445	State Land under the Greenvale MLA
Queensland Rail Limited	C/o Facilities Administration PO Box 1102 Townsville, Qld 4810	1 CLK18 2 CLK18	State Land adjacent to the Greenvale MLA
John Martin, Ronald Andrew and Ronald Peter Bahr	'Leichhardt Station' Bruce Highway Giru, Qld 4809	5 CLK23	Leasehold adjacent to Greenvale MLA
Raymond Victor and Roselyn Elizabeth Vains	'Upsans Downs Station' Greenvale, Qld 4816	22 SP185817	Leasehold adjacent to Greenvale MLA
Reedybrook Pastoral Company Pty Ltd	'Reedybrook Station' MS 87 Mount Garnet, Qld 4872	5 K103526	Freehold under Greenvale – Kokomo Access Road
Judith Elizabeth and Thomas Patrick Sheahan	'Valley of Lagoons Station' MS 102 2602 Abergowrie Road Ingham, Qld 4850	227 OL208	Leasehold under Greenvale – Kokomo Access Road
John Martin, Ronald Andrew and Ronald Peter Bahr	'Leichhardt Station' Bruce Highway Giru, Qld 4809	4 CLK23	Leasehold adjacent to Greenvale – Kokomo Access Road

6.3 PUBLIC CONSULTATION

Initial discussions have been conducted with a number of Queensland Government departments including former DERM – environmental and water divisions, and the former Department of Employment, Economic Development and Innovation. Initial discussions have also been held with the Charters Towers Regional Council, Townsville Port Authority and the community at Greenvale Township. Consultation with Indigenous stakeholders has been ongoing since the granting of Exploration leases. MLM has an Exploration ILUA with the Gugu Badhun, which has been in place since 24 February 2005. MLM is currently undertaking negotiations to develop an ILUA for mining with the Gugu Badhun. This should be completed by June 2012. As part of these negotiations the overall

Project, potential impacts and opportunities have been presented and discussed. MLM has pastoralist landowner agreements with the underlying tenement holders for access to the land and will develop agreements around future disturbance compensation.

Affected and interested persons will be included in the community consultation program for the Project and will be provided with a copy of the Terms of Reference (TOR) Notice and EIS Notice. The community consultation program will include meetings with affected and interested persons as required. All correspondence with interested and affected persons will be recorded in the Consultation Report as a part of the EIS.

The draft TOR will be released for public comment, and to interested and affected persons, for at least 30 business days. At the end of the comment period, copies of all comments received by EHP will be given to the proponent. MLM will then prepare the following:

- a written summary of the comments
- a response to the comments
- proposed amendments to the TOR as a result of the comments received.

EHP will then prepare and publish the final TOR within 20 business days.

MLM will then undertake the necessary assessments, research and consultations to prepare the EIS, in accordance with the TOR. The EIS will support an application for Project approvals, in particular an environmental authority (EA) under the EP Act.

MLM will submit the completed EIS to EHP, who will then assess the EIS and decide whether or not it adequately addresses the published TOR. MLM must then publish an EIS Notice and give a copy of the EIS Notice to each affected and interested person. The submission period for public comment will be set by EHP and must be at least 20 business days. Copies of the EIS will be made available to all interested and affected persons and advisory bodies. EHP will accept all properly-made submissions received during the submission period, and will provide MLM with a copy of all the submissions received on the EIS. MLM must then prepare a response to the submissions and make any necessary amendments to the submitted EIS.

7.0 POTENTIAL OPPORTUNITIES AND RISK MANAGEMENT

7.1 INTRODUCTION

The Project must meet the statutory obligations in the EP Act. This will be achieved through the preparation of an EM plan as part of the EIS, which has to contain environmental protection commitments. It is intended that two plans are developed through the Project, one for the construction phase and one for the operations phase. An EM plan should detail the actions and procedures to be implemented to mitigate adverse, and enhance beneficial, environmental and social impacts. The EM plan will serve as the framework for measuring the effectiveness of environmental protection and management. This is achieved by specifying monitoring, reporting and auditing requirements, including responsibilities, timing and format in order to meet the goals and environmental objectives.

7.2 SUSOP OPPORTUNITIES WORKSHOP

MLM engaged the University of Queensland, Sustainable Operations (SUSOP) to facilitate an opportunities workshop with key MLM staff and contractors. The aim of the workshop was to identify opportunities to improve the sustainable capital of the Project under the key five capitals: human, social, environmental, manufactured and financial. Key opportunities were identified and have been included in a work plan to review and assess the impacts on the Project, which include:

- ore beneficiation studies to upgrade low grade ores into mill feed which will optimise resources
- assessment of former Greenvale waste dumps (6 Mt) to determine if there is low grade ore that could be beneficiated and used as ore (reduce the rehabilitation footprint)
- removal of potential products from the residue and sell including; iron, manganese sulphate, manganese and gypsum, (this will reduce RSF and evaporation pond sizes and hazard rating)
- optimisation of sulphuric acid plant to generate 100% of power needs (reduces demand on grid power and also large CO_2 offset as not using coal fired power)
- water saving options and recycling from sulphuric acid plant and condensate scrubbing
- Kokomo ore slurry pipeline vs trucking study (reduces traffic and CO_2 emissions)
- limestone vs. lime for neutralisation – increased purchase cost for lime vs. CO_2 cost modelling
- residue – investigate dry stacking and other disposal methods that minimise water and reduce RSF size
- post closure options including Nature Reserves
- local people training facilities.

Further assessment of these matters will be conducted and included in the Project design.

7.3 ENVIRONMENTAL HAZARD AND RISKS

There will be a number of environmental hazards and associated risks including, but not limited to the construction and operation of the HPAL process plant. A hazard is a source, or a situation that under the circumstances could potentially cause:

- human injury or impacts on health
- damage to property
- damage to the environment
- a combination of these.

A risk is the likelihood and consequence of an injury or harm occurring as a result of a hazard. Risk management is the systematic application of management policies, procedures and practices to identify, analyse, assess and control the risk.

Formal risk assessments will be undertaken following AS/NZS ISO 31000: 2009 Risk Management – Principles and Guidelines. The assessments will be used to develop appropriate controls. A comprehensive risk assessment will be presented in the EIS.

Health and safety issues associated with both the Project construction and operations phase will be identified in the EIS. Major hazards and risks will be identified. A risk management plan will be developed as part of the Site Health & Safety Management Plan.

8.0 LEGISLATION AND APPROVALS

This section describes the approval framework and relevant legislation to be addressed by the Project.

8.1 COMMONWEALTH LEGISLATION

The following Commonwealth legislation applies to the Project:

8.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to actions which are likely to have an impact on Matters of National Environmental Significance (MNES). The eight matters of MNES protected under the EPBC Act are:

- World Heritage properties
- National Heritage places
- wetlands of international significance (under the Ramsar Convention)
- listed threatened species and ecological communities
- migratory species protected under international agreements
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mines).

The determination of the existence of any significant controlled actions under the EPBC Act and the subsequent level of environmental assessment will be determined as a result of the EPBC referral. The Project has been referred to DSEWPAC. On 20th June 2012, the Department advised MLM in writing that the Project is NOT a controlled action.

8.1.2 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) establishes a national framework for Australian corporations to report greenhouse gas emissions, reductions, removals, offsets, energy consumption and production as of 1 July 2008.

Under the NGER Act controlling corporations are required to register and report if they emit greenhouse gases, produce energy or consume energy at or above the following annual thresholds:

- they control facilities that emit 25 kilotonnes or more of greenhouse gas, or produce / consume 100 terajoules or more of energy, or
- their corporate group emits 50 kilotonnes or more of greenhouse gas, or produce / consume 200 terajoules or more of energy by 2010 / 2011.

The NGER Act describes the manner in which reporting needs to be undertaken.

8.2 STATE (QUEENSLAND) LEGISLATION

The Project is a mining activity and will be assessed under the EP Act as a level 1 mining activity. The following State legislation applies to the Project:

8.2.1 Environmental Protection Act 1994

The EP Act was established to protect Queensland's environment, while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The EP Act utilises a number of mechanisms to achieve environmental protection. These include, but are not limited to:

- compliance with the General Environment Duty
- licensing of specified industrial activities that have the potential to cause environmental harm
- the protection of environmental values
- allowing for improvement through Environmental Management Programs.

Under the EP Act, EHP has assumed responsibility for environmental impact assessment, administration of EAs, as well as compliance, auditing and monitoring of of mining activities.

A range of Environmentally Relevant Activities (ERAs) will be carried out during the construction and operation of the Project. The giving of approvals for these ERAs will form part the giving of an EA, which is a separate assessment process that occurs after the EIS process.

8.2.2 Other State Approvals

It will be necessary to obtain a number of other State approvals in order to progress the Project. These approvals will be identified and confirmed in the EIS. The following approvals are likely to be required.

Table 14 Summary of State Legislation

Legislation	Department	Trigger	Permit/Licence
Aboriginal Cultural Heritage Act, 2003	EHP	Duty of Care to take all reasonable and practicable measures not to harm Aboriginal cultural heritage	Cultural Heritage Management Plan required
Explosives Act 1999	Department of Natural Resources and Mines (DNRM)	Possession, storage and use of Explosives	Plan
Fisheries Act (1999)	Department of Agriculture, Fisheries and Forestry (DAFF)	Impact on aquatic species	Plan
Land Protection (Pest and Stock route Management Act (2002)	DNRM & DAFF	Identification of noxious weeds and pests	Plan

Legislation	Department	Trigger	Permit/Licence
Heritage Act	EHP	Places of Heritage significance on the register	Plan/permit
Mineral Resources Act 1989	DNRM	Tenure issue – convert MLA to ML. Mining regulation implementation	Tenure Mine Plans
Nature Conservation Act (1992) and Nature Conservation Wildlife Regulation (2006)	DAFF & Department of National Parks, Recreation, Sport and Racing	Identification of protected wildlife and fauna	Fauna and flora management plans
Sustainable Planning Act (2009)	Department of State Development, Infrastructure and Planning	Developments off the ML	Approvals
Vegetation Management Act (1999)	DNRM	Land clearing and ecosystems	Management Plan
Water Act (2000)	DNRM	Extraction of Surface Water, Hazardous storage Dam construction, Stream diversions	Water extraction license, Referable Dams permit, Stream diversion permits

9.0 REFERENCES

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