



# Hpakant/Lonkin Gems Tract - Zone 1 Environmental Management Plan

**Myanmar Gems and Jewellery Entrepreneurs Association**  
October 2018

Artisanal and  
small-scale mining  
activities



# **Hpakant/Lonkin Gems Tract – Artisanal and Small-Scale Mining Environmental Management Plan**

Prepared for  
Myanmar Gems Enterprise on behalf of Myanmar Gems and Jewellery Entrepreneurs Association

Prepared by  
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In collaboration with  
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## **Quality Information**

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## Executive summary

This environmental management plan (EMP) covers all mining activities in Zone 1 in the Hpakant/Lonkin Gems Tract in Kachin State, Myanmar. The plan applies to artisanal and small-scale mining occurring in Zone 1.

The objectives of this EMP are to help implement the aspirations and expectations of the Myanmar people, provide a consistent approach to the management of jade mining impacts in the Hpakant/Lonkin Gems Tract, set out measures to determine environmental and social performance of jade mining, and specify transitional arrangements for implementing environmental and social management for jade mining in this area of Myanmar.

This EMP is the first version of the plan. Subsequent versions will introduce further management measures and requirements once satisfactory environmental and social performance has been demonstrated in Zone 1.

## Context and background

The Myanmar Gems Enterprise (MGE) of the Ministry of Natural Resources and Environmental Conservation (MONREC) is responsible for the regulation and marketing of jade and other gemstones in Myanmar. MGE requested preparation of environmental management plans (EMPs) to improve environmental and social management of existing and future jade mining in Myanmar.

This EMP is one such plan and establishes the framework for management of environmental and social impacts of jade mining in Zone 1, one of 10 mining zones in the Hpakant/Lonkin Gems Tract. Valentis Services Company Limited, a Myanmar-based mining exploration and services company, and Coffey Myanmar Limited, an international consulting company have prepared this EMP (together with EMPs for the other nine zones) on behalf of the Myanmar Gems and Jewellery Entrepreneurs Association (MGJEA). Although gold mining is often carried out in conjunction with jade mining, the scope of this plan is limited to the management of jade mining.

Information collected from field visits to the Hpakant/Lonkin Gems Tract has informed the preparation of this EMP. Consultation has been undertaken with government agencies, and people involved in the jade mining industry. An advisory group has also provided Valentis/Coffey with advice on the issues addressed in this EMP. The group includes representatives of Myanmar Government regulatory authorities, Kachin State Ministers, Estelle Levin Limited (ELL), jade miners and non-government organisations.

Stakeholders consulted raised a wide range of issues and concerns, many outside the scope of this EMP. Issues raised by communities in Zone 1 included their reliance economically on mining companies, drug use and associated crime, dust nuisance, traffic safety, blasting impacts (including hearing loss), availability of water, flooding from waste rock blocking some tributaries, and land stability especially around the villages.

The legal framework for jade mining is provided by the Myanmar Gemstone Law. The Second Amending Law of the Myanmar Gemstone Law (2016) requires detrimental environmental effects of jade mining to be managed. MGE has issued numerous notifications and letters under this law to mining companies in the Hpakant/Lonkin Gems Tract requiring improved environmental and social performance.



## Existing environment

Zone 1 drains to Uru Creek via several tributary streams which have been highly modified by jade mining. Uru Creek is a tributary of the Chindwin River, a tributary of the Ayeyarwady River which flows into the Andaman Sea. Large-scale mining in Zone 1 has resulted in open pits up to 250 m deep, many with steep slopes and some filled with water forming pit lakes. Waste rock dumps cover most of the area. Settlements and villages occupy areas not required for mining. Remnant vegetation persists in undisturbed areas of Zone 1 (the northern and western regions).

Several decades of artisanal mining and large-scale mining in Zone 1, including direct disposal of overburden into watercourses, has severely degraded watercourses with visual signs of elevated sediment concentrations and suspended sediments. Erosion is extensive from mined faces and waste rock dumps. No erosion and sedimentation controls are in place. Wastewater from local communities, and water collected from pits is discharged to watercourses. No major flooding was reported in Zone 1, but water runoff may impact downstream areas of Uru Creek due to higher water flow during the rainy season.

Three main villages are located in this zone and are home to approximately 900 residents. Some residential properties are located only a few metres away from the mine sites, and villagers' primary income is based on jade mining and jade scavenging through mine waste dumps. Two private health clinics and one school are located within the zone. Community-based groups have been established to carry out rescues after natural disasters and fires. A number of religious monuments are present, including pagodas, monasteries and churches. Graveyards (which have been moved twice) are the most significant cultural feature in Zone 1.

## Project description (mining activities) and their impacts

The Hpakant/Lonkin Gems Tract is organised into jade mining areas known as maws. Concessions are granted within each maw and are demarcated with either a wooden post or rock piles. There are 23 maws located in Zone 1. The number of concessions within these maws is unknown. Large-scale mining and artisanal and small-scale mining are carried out in this zone.

Stone pickers (locally known as Yemasay) illegally work in mines and on waste rock dumps searching through active workings and waste rock dumps for smaller pieces of jade. Yemasay can be formed into groups who work under a 'lawpan' who provides them with accommodation, food, transport and tools, in exchange for a share of any jade found.

Artisanal and small-scale jade mining is done by hand using hand tools (iron bars and picks), portable jack hammers and in some instances, water pumps and hoses. Alluvial gold and jade mining occurs along the banks of the major watercourses including Uru Creek. Alluvial gold and jade bearing material is washed from the banks by hydraulic pressure using water pumps and hoses, and then through sluice boxes and riffles to trap any gold. Jade stones are recovered from the washed material. Artisanal and small-scale mining is typically carried out by individuals, small groups of people or family units.

Mining impacts the physical, biological, social and cultural environment in Zone 1. Impacts arise from land disturbance (clearance of vegetation and earthworks), physical changes to watercourses and contamination of water, inappropriate waste disposal, generation of dust, noise and vibration, increased road traffic and other health and safety hazards. Towns, villages and settlements in Zone 1 also experience a range of impacts on livelihoods and amenity, from a loss of property and need for

resettlement, to loss of access to traditional resources and religious sites. Mining also brings more people into the zone, with indirect health and economic impacts on local residents through for example increased exposure to alcohol and drugs, and increased competition for jobs, and goods and services.

A detailed review of hazards has been carried out to identify environmental and social impacts of artisanal and small-scale jade mining. Most impacts can be managed with standard measures, procedures and good practice. The most significant residual impacts related to: unsafe mine sites and unsafe working practices, which together with the large number of Yemasay on mine sites, could lead to serious injury and death; slope failure causing landslides; and flooding due to watercourses being infilled with sediment. These are major risks to people and property and the environment in Zone 1.

## Mitigation measures

This EMP includes measures and procedures for managing all identified environmental and social impacts, with particular focus on the major and high residual impacts. These include standard management measures that apply to all mining phases and management measures that apply to each phase – before mining, during mining and after mining. The management measures and procedures are set out in this EMP.

## Implementation and monitoring

The mine owner is responsible for implementing this EMP and must adequately resource environmental management of the mining activities. All workers must be trained in the requirements of this plan. All workers are responsible for ensuring that their work complies with the conditions of all relevant legislation, the management measures and procedures outlined in the EMP, and any relevant directive, notification, order or Environmental Compliance Certificate issued by ECD.

This EMP is the first step towards improving the environmental and social performance of artisanal and small-scale jade and alluvial gold mining in the Hpakant/Lonkin Gems Tract and does not, at this stage, require full implementation of Myanmar National Environmental Quality (Emission) Guidelines. The EMP instead focusses on guidelines and standards that address the highest risks to the environment, communities and people.

Specific inspection and monitoring requirements are set out in this EMP. The mine owner or a delegated worker is responsible for regular inspection, monitoring and reporting of ASM activities. Discharges to the environment will be inspected and monitored regularly during mining. Other, ad hoc audits should be undertaken in response to, for example, a serious incident, after a storm event, and/or following an environmental-related complaint from the community.

The mine owner will report compliance with the ASM EMP on request through provision of the compliance checklist that reviews mining performance against the requirements set out in this EMP. The report will include outcomes of inspections and monitoring. The mine owner will report serious incidents to MGE and obey the instructions of MGE in managing and investigation the incident.

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# 1 Introduction

The Myanmar Gems Enterprise (MGE) of the Ministry of Natural Resources and Environmental Conservation (MONREC) is responsible for the regulation and marketing of jade and other gemstones in Myanmar. MGE seeks to improve regulation and the environmental and social performance of the jade mining industry in Myanmar. To achieve this, MGE has requested environmental management plans (EMPs) be prepared to improve environmental and social management of both existing and future jade mining.

MGE has instructed the Myanmar Gems and Jewellery Entrepreneurs Association (MGJEA) to act as the project proponent and fund the project. MGJEA has engaged Valentis Services Company Limited (Valentis), a Myanmar-based mining exploration and services company, and Coffey Myanmar Limited (Coffey), an international consulting company, to prepare EMPs for ten zones in the Hpakant/Lonkin Gems Tract in Kachin State, Myanmar (Figure 1.1). Each EMP applies to jade mining activities in the zone, rather than for a specific mine.

This EMP covers artisanal and small-scale mining (ASM) within Zone 1. Figure 1.2 shows the location of this zone. This EMP establishes the framework for management of environmental and social impacts of ASM jade mining in Zone 1 and will be the first step in the process required to improve the performance of the jade mining industry. This EMP is the first version; subsequent versions will introduce further management measures and requirements once satisfactory performance has been demonstrated.

An advisory group comprising a diverse range of stakeholders has provided Coffey-Valentis with advice on the issues addressed in this EMP. The advisory group comprises representatives of Myanmar Government regulatory authorities, Kachin State Ministers, Estelle Levin Limited (ELL), jade miners and non-government organisations. Field visits have also been undertaken to the Hpakant/Lonkin Gems Tract.

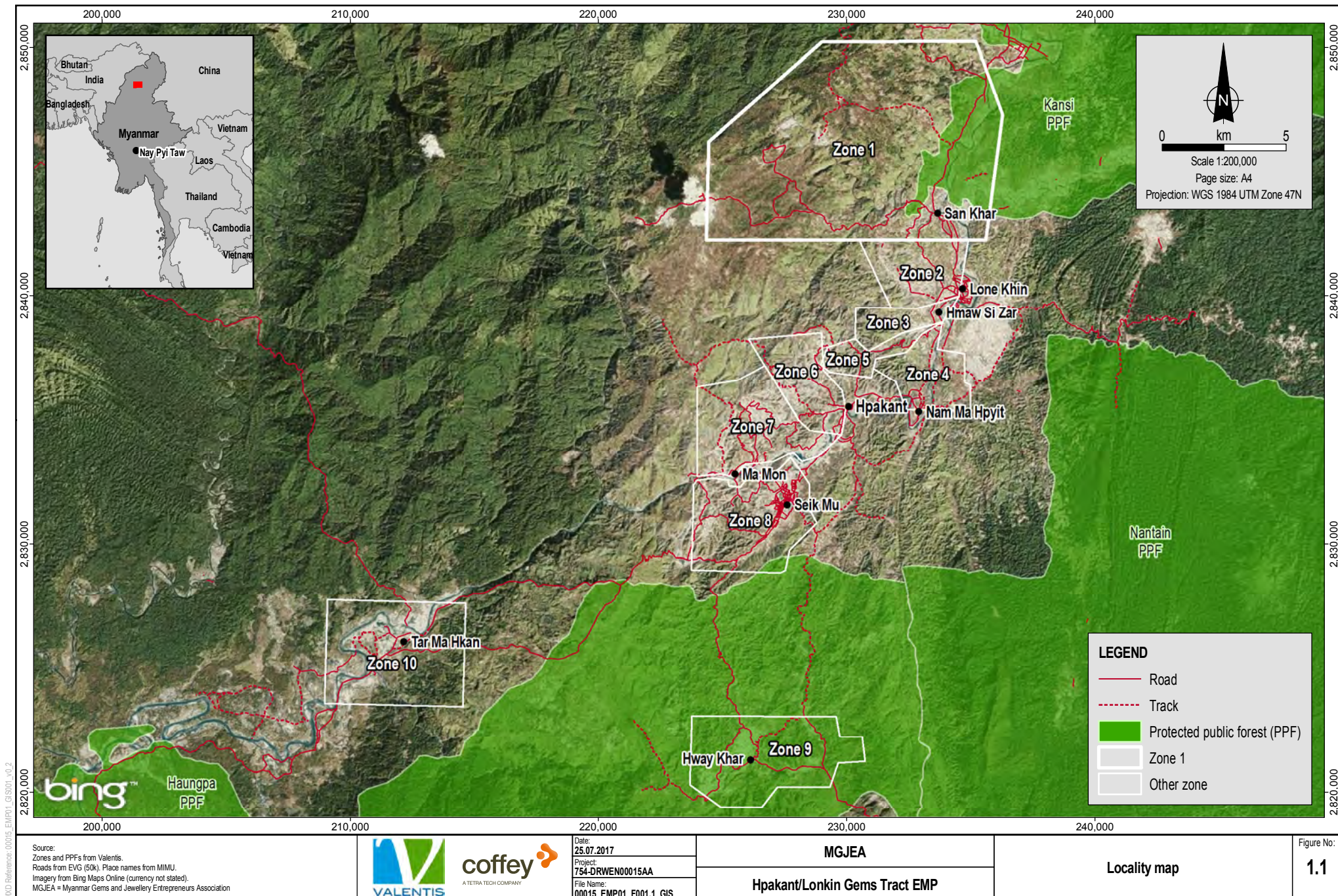
## Background

Myanmar is widely considered to produce the best jade in the world, with considerable and growing demand both locally (shops and markets across Myanmar) and internationally (at the annual Gems Emporium). Myanmar jade accounts for approximately 90 percent of the world's jade and commands the highest prices at market (Irwin, 2016). The Hpakant/Lonkin area of Kachin State is the main jade-producing area of Myanmar, followed by the Hkmati area in Sagaing Region.

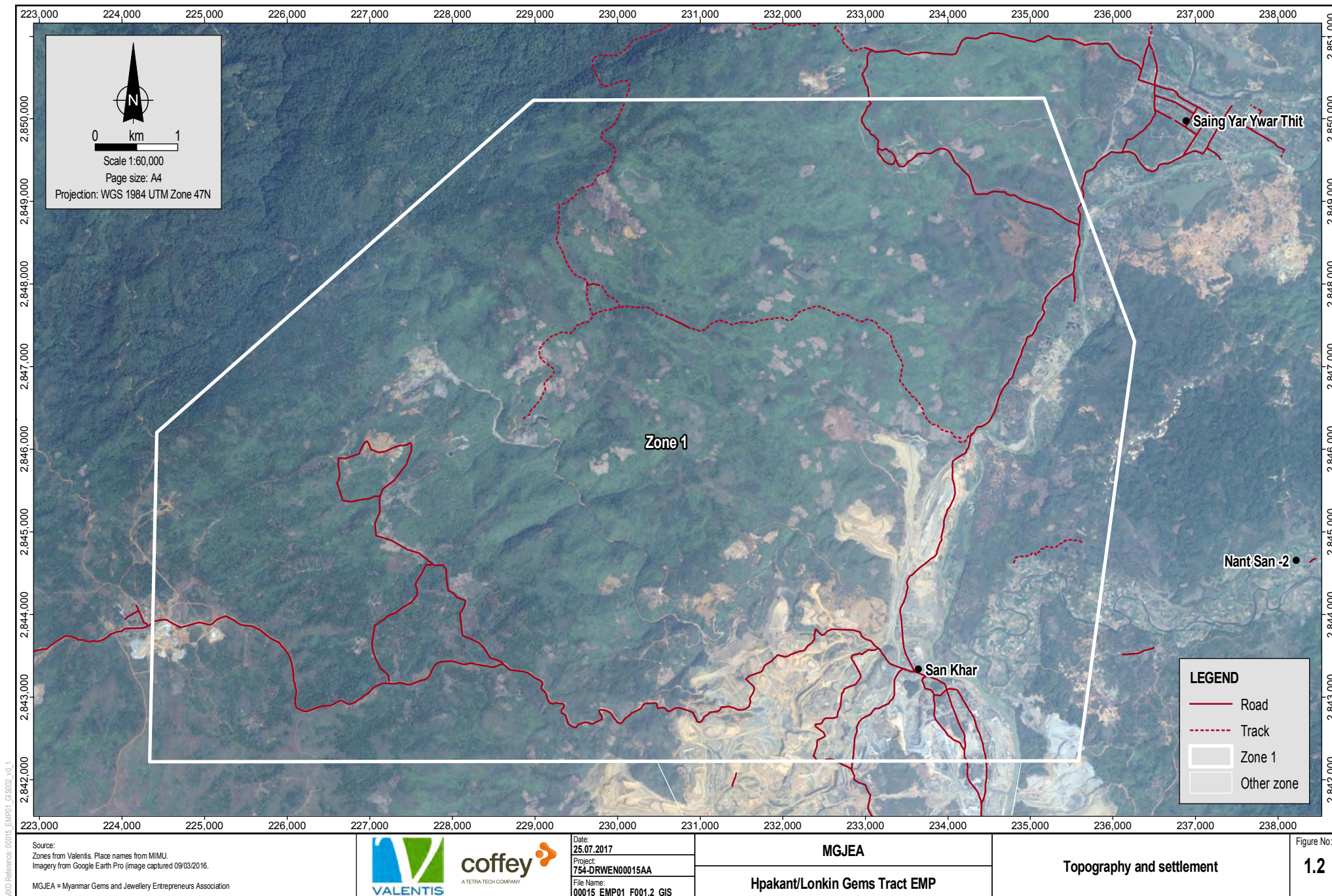
The large scale, mechanised and intensive jade mining at Hpakant/Lonkin started as recently as the mid-1990s. Prior to this time, the majority of the jade mining was smaller scale, subsistence mining.

A moratorium was in place on jade production in Hpakant from March 2012 until September 2014 after the breakdown of a 17-year ceasefire agreement between the government and the Kachin Independence Organisation in 2011 (Irwin, 2016). Operations were temporarily halted in 2015 when renewed fighting broke out and resumed in March 2015 (Irwin, 2016). The scale of jade mining has increased significantly after the official resumption in late 2014, with mining companies relying on more and more powerful and sophisticated equipment.









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## 2 Definitions

**Artisanal and small-scale mining** – mining with hand tools and small machines. Hand tools include iron bars, diamond-tipped hammers, picks and hoes. Machines include water pumps and hoses to hydraulically expose jade and alluvial gold-bearing ore, and sluice boxes to capture gold. In some instances, an excavator and several small trucks may be used to remove overburden and excavate jade and alluvial-gold bearing ore.

**Catchment area** – an area where all runoff from rainfall drains to a watercourse, lake or the sea. A catchment area may comprise several smaller catchments.

**Chance find** – an unexpected discovery of cultural heritage.

**Communicable disease** – an infectious disease transmissible from person to person either by direct or indirect contact.

**Cultural heritage** – a site, building or artefact having historical, religious, cultural, or archaeological significance, including graveyards and burial sites. A site, building or feature defined under applicable laws.

**Cut-off drain** – a channel dug into the ground upstream of a mine face to collect and divert water away from the mine face.

**Diversion bund** – a mound of earth constructed to divert water away from slopes or mine faces. Often constructed in conjunction with a cut-off drain.

**Drainage line** – a depression or low point that will collect water and cause it to flow downhill.

**Grievance** – a complaint lodged by an affected party alleging damage, impact, or dissatisfaction specifically resulting from the actions, or a lack of action, by a mining company. A grievance is usually raised with the expectation of a corrective action, compensation or both.

**Guideline values** – maximum concentrations or specified ranges of concentrations of a pollutant that should not be exceeded.

**Hazardous material** – any solid, liquid or contained gaseous substance with properties that make it potentially dangerous or harmful to human health, safety and/or the environment. Hazardous properties might include the following:

- Flammable i.e., burns easily.
- Corrosive e.g., very high (alkaline) or low (acid) pH.
- Reactive e.g., explosive or toxic.
- Biological e.g., medical waste.

**Hazardous waste** – any unwanted or unusable hazardous material.

**Hydraulic jetting** – a stream of water delivered by a high-pressure hose at a face to dislodge and wash away soils or subsoils to expose jades (historically known as placer mining).

**Involuntary resettlement** – the involuntary taking of land resulting in relocation, loss of shelter, loss of assets, or loss of means of livelihood. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood as a result of project-related land acquisition and/or restrictions on land use).

**Large-scale mining** – mining using heavy machinery including fleets of vehicles, haul trucks, excavators, and other plant and equipment to excavate large volumes of overburden and jade bearing material.

**Mine face** – the active working part of an open pit.

**Mine wall** – the walls of an open pit.

**Mining company** – a company, joint venture, cooperative, persons or person holding a permit to produce gemstone from a gemstone block or concession.

**Non-hazardous waste** – any unwanted or unusable solid, liquid or gaseous substance that does not pose an immediate hazard to human health, safety and/or the environment.

**Overburden** – rock or soil overlying a mineral deposit or gemstone bearing formation.

**Pit toilet** – a type of outdoor toilet excavated in the ground, used where it is impractical to provide a standard, flushing-type toilet.

**PPE** – personal protective equipment. Refers to specialised clothing or equipment worn by workers for protection against health and safety hazards at a work site. As a minimum, PPE would include high-visibility clothing or vest, long trousers, long-sleeved shirt, boots and gloves. Where needed PPE would include a safety helmet, safety glasses, ear muffs, a face mask and breathing apparatus.

**Riparian** – relating to the area adjacent to or situated on the banks of a watercourse or waterbody, for example river banks and or lake shores.

**Runoff** – water flowing across land following rainfall.

**Sediment trap** – a structure constructed across a drainage line to slow water and cause suspended soil to settle. Typically excavated into the ground and constructed of rocks and gravel.

**Silt fence** – a fence placed across a drainage line to slow water and cause suspended sediment to settle. Typically made of straw bales or woven mats or fabric.

**Sluicing** – a process to recover jades and gold by washing jade and gold bearing material through a sluice box with water. Gold or jades are collected in the riffles or ribs at the bottom of the box. Waste soil is washed from the box by the steady stream of water. Larger stones are often removed by hand and discarded.

**Waste rock** – all material excavated to recover gold and/or jade.

**Waste rock dump** – designated area for the disposal of overburden and waste rock.

**Watercourse** – a creek, stream, river or other water channel, either natural or man-made, temporary or permanent.

**Worker** – any person working for a mining company including all mining company owners, employees, contractors, subcontractors and family members.

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### 3 Project description (mining activities)

The mining tenure and artisanal and small-scale mining (ASM) methods used in this zone are described in this section.

#### 3.1 Mining tenure

The Hpakant/Lonkin Gems Tract is organised into jade mining areas known as maws. There are 109 maws. Concessions are granted within each maw and are demarcated with either a wooden post or rock piles. Maws located in this zone include:

- Kadamaw.
- Katta.
- San Ka Htan.
- SanKar.
- Taw Maw (Yan pyo).
- Taw Maw (La Jaung).
- Du Maw.
- Pan Kyar Maw.
- Pa Wa.
- Myin Maw.
- Maw Sit.
- Maw Kyein.
- Shwe Win Maw.
- Lay Aein Su.
- La Gaung.
- Wa Lu.
- War Kyel.
- War Toe.
- Aung Sein.
- Aba (U Pai).
- Bone Gar.
- War Boe (U Pai).

The number of ASM concessions within these maws is unknown.

#### 3.2 Artisanal and small-scale mining methods

Artisanal and small-scale jade mining is done by hand using hand tools (iron bars and picks), portable jack hammers and in some instances, water pumps and hoses. Small-scale jade mining typically targets the Uru Boulder Conglomerate formations exposed by large-scale mining. Jade is mined vertically through the formation in 2 m wide blocks, 1 to 2 m apart (Plate 3.1).

Jade mining occurs along the banks of the major watercourses including Uru Creek. Jade bearing material is washed from the banks by hydraulic pressure using water pumps and hoses. Jade stones are recovered from the washed material (Plate 3.2). Alluvial jade mining often occurs in conjunction

with alluvial gold mining. Alluvial gold is recovered by washing gold-bearing ore through sluice boxes and riffles that trap the gold.

Artisanal and small-scale mining is typically carried out by individuals, small groups of people or family units.



Source: Soe Moe Kyaw Win

**Plate 3.1 Small-scale mining of shallow Uru Boulder Conglomerate**



Source: Soe Moe Kyaw Win

**Plate 3.2 Alluvial mining in the banks of Uru Creek**



The main equipment used in ASM typically consists of:

- Hand tools including iron bars, diamond-tipped hammers, picks and hoes.
- Machines including water pumps and hoses to hydraulically expose jade and gold-bearing ore.
- Sluice boxes to capture alluvial gold.

In some cases, excavators and several small trucks may be used to remove overburden and excavate gold-bearing ore.

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#### 4. Commitment

##### Project Proponent's letter of endorsement

According to Environmental Impact Assessment Procedure – clause 77, the project proponent endorses that the following data are correct.

- (a) The Environmental Management Plan (EMP) is accurate and complete.
- (b) The EMP has been prepared in strict compliance with applicable laws including Environmental Impact Assessment Procedures.
- (c) The commitments, mitigation measures and plans in Environmental Management Plan (EMP) will always be complied at all times **where applicable**.

Name .....  
LA HPAI HKUN SA  
Position .....  
CHAIRMAN  
MYANMAR GEMS & JEWELLERY  
Signature .....  
ENTREPRENEURS ASSOCIATION

For and on behalf of the Myanmar Gems and Jewellery Entrepreneurs Association

Date ..... 18.7.2019 .....

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## 5 Environmental management framework

The Myanmar laws, rules and guidelines that require environmental and social impacts of artisanal and small-scale jade mining to be managed and the objectives of this EMP are set out in this section.

### 5.1 Myanmar laws, rules and guidelines

The Myanmar laws, rules and guidelines that must be complied with in implementing this EMP are listed in this section.

#### Myanmar citizens' rights

**Constitution of the Republic of the Union of Myanmar**, specifically:

- Article 21(a) Every citizen shall enjoy the right of equality, the right of liberty and the right of justice, as prescribed in this Constitution.
- Article 34 Every citizen is equally entitled to freedom of conscience and the right to freely profess and practise religion subject to public order, morality or health and to the other provisions of this Constitution.

#### Regulating gemstone production

**The Second Amending Law of the Myanmar Gemstone Law (2016)**, specifically:

- Section 4(d) empowers the Ministry of Mines to acquire land or legally transfer land with the consent of the owner that is within a gemstone tract.
- Section 15(b) requires the Ministry of Mines to issue a gemstone production permit if the applicant pays the determined price within the specified time.
- Section 15(c) requires the Ministry of Mines to determine the tenure and price of any extension of a small-scale gemstone production permit.
- Section 16 requires a gemstone production permit holder to abide by rules, procedures, orders and directives issued under this law, the conditions of the permit, to pay royalties, to manage workers' conditions and wages in accordance with the law, and to make provisions for the prevention of environmental impacts.
- Section 36 sets out the duties of the Chief Inspector including right to inspect mine sites for compliance with rules, orders and directives, the health and safety of workers, and environmental impacts of gemstone production.

#### Protecting the environment

**The Environmental Conservation Law (2012)**, specifically:

- Section 7(o) requires polluters to pay for environmental damages caused.

- Section 14 requires point source emissions/pollution to comply with environmental quality standards.
- Section 15 requires owners and occupiers to monitor and manage point source emissions/pollution using environmentally sound methods.
- Section 24 permits the Ministry to stipulate terms and conditions for environmental conservation and to conduct inspections to ensure compliance with the terms and conditions.
- Section 29 requires that no person violates the requirements set out in orders, directives and procedures issued under this law.

**Environmental Conservation Rules (2014)**, specifically:

- Rule 68, requires owners of small enterprises to obtain the Environmental Conservation Department's advice regarding impacts of its business before applying for a licence to operate the business.

**Environmental Impact Assessment Procedure (2015)**, specifically:

- Articles 102 to 110 set out a project proponent's legal and financial obligations, and obligations to monitor its preconstruction, construction, operation, decommissioning, closure and post-closure activities, and to comply with applicable laws, rules, standards, the EMP and ECC.
- Article 113 requires a project proponent to grant the Ministry or its representatives access to its sites for monitoring and inspection purposes.
- Article 115 requires a project proponent to grant immediate access to its site in event of emergency or where there is a risk of non-compliance with environmental and social requirements.
- Article 117 requires a project proponent to grant the Ministry rights of access to the proponent's contractors and subcontractors.

**National Environmental Quality (Emission) Guidelines** set out the general guideline values that apply during mine construction and operation. These guidelines are designed to regulate large-scale mining and are not suitable for ASM, as practiced in the Hpakant/Lonkin Gems Tract. The National Environmental Quality (Emission) Guidelines will not be applied to ASM. The management measures set out in this plan are designed to achieve outcomes that will result in air quality, water quality and noise levels consistent with the guideline values.

## Protecting biodiversity

**The Protection of Wildlife and Conservation of Natural Areas Law (1994)**, specifically:

- Section 36 makes it an offence to kill, hunt, wound, possess, or sell normally protected wild animals, extract, collect or destroy wild plants; destroy an ecosystem or any natural area, or interfere with the boundary of a natural area without permission from the Director General of the Forest Department.
- Section 37 makes it an offence to kill, hunt, wound, or sell completely protected wild animals, or export a completely protected wild animal or protected wild plant and any part thereof without permission from the Director General of the Forest Department.

**The Forest Law (1992)**, specifically:

- Section 4 empowers the Minister for Forests to reserve forest for the protection of watersheds and catchments, and conservation of the environment and biodiversity.
- Section 5 empowers the Minister for Forests to declare areas outside reserved forests for the protection of water and soil, conservation of dry-zone forests, the environment and biodiversity.

## Protecting rivers, water resources and fisheries

**The Conservation of Water Resources and Rivers Law (2006)**, specifically:

- Section 8 prohibits persons doing works on watercourses or changing watercourse channels that ruin or cause waste of the water resources.
- Section 11(c) prohibits persons from disposing of soil and other materials from mining into watercourses or waterbodies or gullies which flow to watercourses or waterbodies.
- Section 22 requires persons to obtain permission to stockpile materials on river banks and waterfronts.

**The Conservation of Water Resources and Rivers Rule (2013)** prohibits dumping of rubbish and dangerous materials in rivers.

**Freshwater Fisheries Law (1991)**, specifically:

- Section 36 requires permission from the Department of Fisheries to construct, maintain or use a dam, bank or weir on freshwater fishery waters.
- Section 40 prohibits persons from harassing fish or aquatic organisms or polluting their habitat.
- Section 41 prohibits persons from affecting water quality and quantity in a leasable or reserved fishery and the rivers and creeks supplying water to that fishery.

## Protecting cultural heritage

**The Protection and Preservation of Antique Objects Law (2015)**, specifically:

- Section 12 requires anyone who finds an antique object to notify the relevant ward or village tract administrator.

**The Protection and Preservation of Ancient Monuments Law (2015)**, specifically:

- Section 15(f) requires a person to obtain prior permission from the Department of Archaeology and National Museum to dig, quarry or mine within the specified area of an ancient monument which includes buildings, religious buildings and structures, natural and manmade caves, and other manmade structures and features.

**The Protection and Preservation of Cultural Heritage Regions Law (1998)**, specifically:



- Section 13 requires a person to obtain prior permission from the Department of Archaeology for work within an ancient monument site or zone, on a building within a zone, in a cultural heritage region, and to construct a bridge, canal or embankment, or carry out an archaeological excavation.
- Section 22 requires buildings in cultural heritage regions to be constructed in accordance with conditions set by the Ministry of Culture.

## Protecting public and worker health

**Public Health Law (1972)**, specifically:

- Section 3(1) requires the government to advise, inspect and supervise activities for a healthy environment including garbage disposal, drinking water, pollution and building construction and maintenance.
- Section 3(4) requires the government to prevent and eliminate contagious diseases including through public vaccination programs.
- Section 4 empowers the government to form, direct and advise groups and government ministries and departments on public health matters set out in this law.
- Section 5 grants organisations appointed by the government to carry out inspections of workplaces, shops and buildings regarding environmental health matters including food, products, housing and private clinics.

**The Prevention and Control of Communicable Diseases Law (2015)**, specifically:

- Section 3 requires the Department of Health to immunise children against communicable diseases and educate people about these diseases to prevent outbreaks.
- Section 4 requires the Department of Health to control the spread of an outbreak of a principal epidemic disease or notifiable disease through immunisation and other measures.
- Section 9 requires households to report communicable disease outbreaks to the nearest health department office or hospital.
- Section 11 outlines the measures a health officer may take to prevent and control the spread of communicable diseases including inspections and medical examinations.

**The Control of Smoking and Consumption of Tobacco Product Law (2016)**, specifically:

- Section 9 requires non-smoking areas to be designated, clearly marked and supervised.

## Protecting workers' rights

**Myanmar Investment Law (2016)**, specifically:

- Section 51 requires investors to employ qualified people as senior managers, and technical and operational experts, and to ensure they have the entitlements and rights of labour laws and rules.
- Section 73 requires the investor to obtain and maintain the type of insurances stipulate in the rules.

**Minimum Wages Act (2013)**, specifically:

- Sections 12 and 13(a) to (g) which set out the duties of an employer to pay minimum wages.

**Payment of Wages Law (2016)**, specifically:

- Sections 3 to 5 which set out the methods and timeframes for payment of wages.
- Sections 7 to 10 which set out the wage deductions employers are entitled to make.
- Section 14 which set out the requirement for employers to pay overtime wages in accordance with the law.

**The Leave and Holidays Act (1951)** sets out worker's entitlements to public holidays and annual leave.

**Employment and Skill Development Law (2013)**, specifically

- Section 5 requires an employment agreement and sets out the content of the agreement.
- Section 14 requires an employer to train employees in the type of work they are being employed to do.
- Section 30(a) and (b) requires employers to make monthly payments to a training fund not less than 0.5% of total wages for the company.

**The Labour Organisation Law (2011)**, specifically:

- Section 17 permits labour organisations to draw up their constitution and rules, and gives them the right to negotiate with employers.
- Section 18 grants a labour organisation the right to request an employer reappoint employees if their dismissal relates to their membership of a labour organisation.
- Section 19 gives labour organisations the right to represent workers in settling a dispute before the Conciliation Body.
- Section 20 gives labour organisations the right to participate in discussions with the government, employers and complaining workers on their rights.
- Section 21 gives labour organisations the right to participate in collective bargaining in accordance with the labour laws.
- Section 22 requires labour organisations to conduct their activities peacefully.

**The Settlement of Labour Disputes Law (2012)**, specifically:

- Section 38 requires employers to negotiate a complaint within prescribed period.
- Section 39 does not allow employers to alter a worker's conditions during or after a dispute that is before an arbitration body or tribunal.
- Section 40 prohibits employers locking out workers or workers striking over a dispute without seeking to negotiate or seek conciliation or arbitration by an arbitration body or tribunal.
- Section 51 requires employers to compensate workers whose benefits are reduced as a result of a dispute.

**The Social Security Law (2012)**, specifically:

- Section 11(a) requires companies to register for the social security system and benefits contained in law if they employ a minimum or greater number of people determined by the Ministry of Labour.
- Section 15(a) outlines funds included in the social security fund including health and social care, family assistance, and invalidity, superannuation, survivors and unemployment benefits, and social housing plan.
- Section 18(b) require employers to deduct contributions from workers' wages and to pay that money and the employers contribution to the social security fund.
- Section 48 requires employers to have insurance for the employment injury benefit fund, and workers to submit a medical certificate when claiming against the fund.
- Section 49 states employees covered by the employment injury benefit fund under this law, cannot make claims under the Workmen's Compensation Act 1923.
- Section 75 sets out employers' obligations to maintain records of employee appointment, contact details, work, injuries and termination, and to make that information available to the social security offices on request.

**The Workmen's Compensation Act (1923)**, sets out an employer's obligations to arrange for injured workers to be treated and compensated for injuries sustained while working.

**The Electricity Law (2014)**, specifically:

- Section 59 requires a company or person holding a licence to do electricity-related work to compensate persons injured, disabled or killed by electrocution or fire caused by an electrical fault in accordance with the applicable labour compensation law or the provisions of this law.

## **Managing dangerous goods and products**

**The Petroleum and Petroleum Products Law (2017)**, specifically:

- Section 9 requires a licence from the Ministry of Transportation and Communication to transport petroleum and petroleum products in vehicles, boats, barges and trailers. It requires accidental leaks and spills to be cleaned up in accordance with current laws.
- Section 10 requires a licence from the Ministry of Natural Resources and Environmental Conservation for the storage of petroleum and petroleum products and for the transportation of petroleum and petroleum products.
- Section 11 requires dangerous petroleum and petroleum products to be clearly marked with appropriate signage.
- Section 31 outlines obligations of license holders to protect the environment from accidental leaks and spills of petroleum and petroleum products.

## Managing road transport and motor vehicles

**Motor Vehicle Law (2015)** requires motor vehicles to be registered and drivers to be licensed for particular types of vehicles. It aims to provide a safe and efficient road network and to reduce pollution from motor vehicles.

## Using appropriately qualified experts

**The Myanmar Engineering Council Law (2013)**, specifically:

- Sections 20 to 25 allow suitably qualified persons to apply for registration as a graduate technician or technician, and the Myanmar Engineering Council to issue a certificate of registration.
- Sections 26 to 30 allow suitably qualified persons to apply for registration as a registered engineer, and the Myanmar Engineering Council to issue a certificate of registration.
- Section 31 grants registered graduate technicians, technicians and engineers the right to practice their relevant discipline or area of expertise and requires them to abide by the laws, rules and procedures issued under the law.

## 5.2 Requirement for implementation of this EMP

Jade mining is authorised and regulated by the Myanmar Gemstone Law. The Second Amending Law of the Myanmar Gemstone Law (2016) requires the environmental and social impacts of jade mining to be managed.

Article 3(f) states the objectives of the law are “*not to impact the activities of environmental conservation by gemstone production*”.

Article 16(f) requires the gemstone production permit holder to “*abide by the rules, procedures, orders and directives issued under this Law in respect of the following matters*”. Article 16(f)(5) states “*making provisions for the prevention of detrimental effects on the environmental conservation works due to gemstone production operation*.”

Article 46(a) requires the gemstone production permit holder to “*respect to be the least of environmental impact and not to have social impact of the public in carrying out the process of production of gemstone*”.

Article 54 provides the powers necessary for the Ministry of Mines, the Department of Mines and the Myanmar Gems Enterprise to issue notifications, orders, directives and procedures. Article 54 states:

*54. In implementing the provisions of this Law:*

*(a) The Ministry of Mines may issue rules, regulations and bye-laws with the approval of the Union Government;*

*(b) The Ministry of Mines may issue notifications, orders, directives and procedures;*

*(c) The Department of Mines and Myanmar Gems Enterprise may issue orders and directives with the approval of the Ministry of Mines.*

The Environmental Impact Assessment (EIA) Procedure (2015) sets out the requirements for the environmental and social impact assessment of projects and their environmental management.

Annex 1 lists the activities for which environmental and social impact assessment is required and the type of impact assessment required for the activity. No 136 requires an Initial Environmental Examination (IEE) to be prepared for precious stone mining covering an area less than 20 ha and less than 50,000 tonnes per annum. An Environmental Impact Assessment (EIA) is required for precious stone mining covering an area greater than or equal to 20 ha or greater than or equal to 50,000 tonnes per annum.

Artisanal and small-scale mining activities are unlikely to trigger the need for an IEE or EIA to be prepared.

Where mining activities were in progress before the introduction of the Environmental Conservation Rules, Article 8 of the EIA Procedure requires an Environmental Management Plan (EMP) to be prepared and to be informed by an environmental and social audit. This EMP has been prepared for a zone and all ASM activities in the zone.

MGE and the Department of Mines may, with the approval of the Ministry of Mines, issue orders and directives. MGE has issued numerous notifications and letters to mining companies in the Hpakant/Lonkin Gems Tract requiring improved environmental and social performance. MGE or the Department of Mines could require the EMP to be implemented by existing and new jade mines by issuing an order or directive. Figure 5.1 shows three ways in which the EMP could be implemented.

The content of an EMP is set out in Article 63 of the EIA Procedure. Further guidance on mining-related EMPs is provided in the guidance note Environmental Management Plan for Mining Sector. This EMP has been prepared in accordance with the EIA Procedure and Environmental Management Plan for Mining Sector.

## Notifications

Myanmar Gems Enterprise Department of Jade Mining has issued notifications under Article 54(b) of The Myanmar Gemstone Law (1995) and Article 54(c) of The Second Amending Law of the Myanmar Gemstone Law (2016) for the Hpakant/Lonkin Gems Tract.

The notifications relevant to artisanal and small-scale mining are:

- Notification Letter No. 121/99, October 4, 1999.
- Letter No. Ka-37/295/2017, December 29, 2014.
- Letter No. Ka-37/146/2016, January 26, 2016.
- Letter No. Ka-37/383/2016, May 23, 2016.

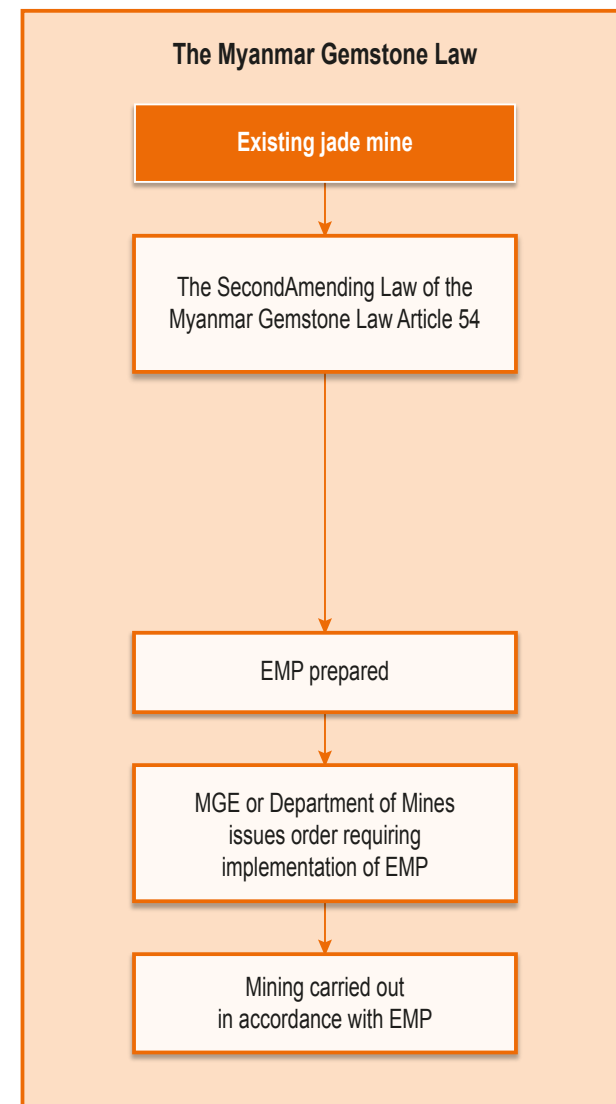
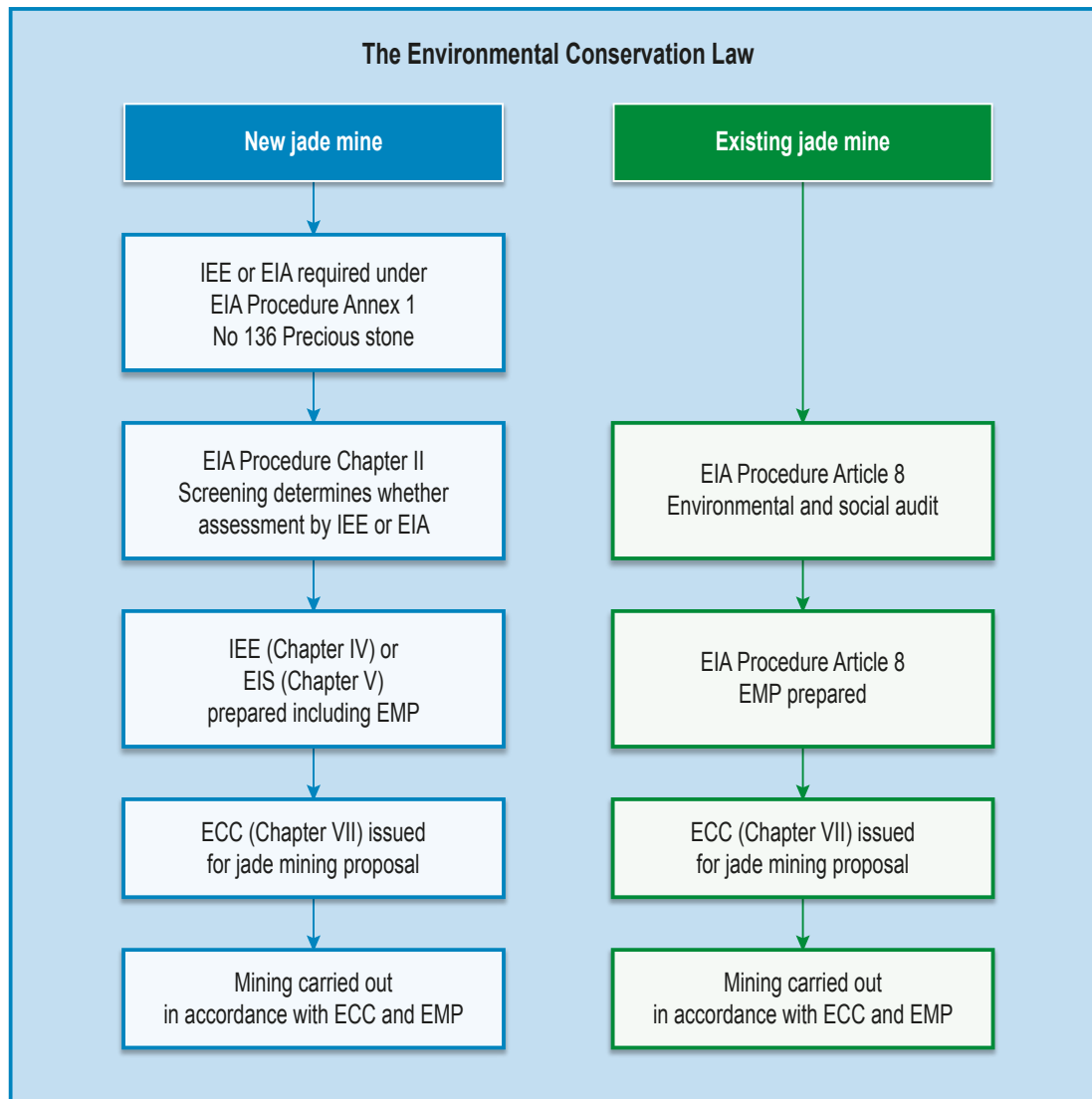
These notifications are attached to this EMP in Appendix 1.

## 5.3 Objectives of this EMP

The objectives of this EMP are:

- Implement the aspirations and expectations of the Myanmar people, as set out in the Constitution of the Republic of the Union of Myanmar.
- Provide a consistent approach to the management of environmental and social impacts of artisanal and small-scale jade mining in the Hpakant/Lonkin Gems Tract.
- Set out the measures for determining environmental and social performance of artisanal and small-scale jade mining.





## 6 Existing environment

Jade from the Hpakant/Lonkin area has been mined since the 1800s largely under the influence of the Burmese monarchy and the Duwas (or chiefs) of the area that is now Kachin State. Jade was exported mainly to China. Economic growth in China in the late 1990s facilitated a rapid expansion of the jade industry. Historically, jade has been mined using open cut methods, although during the 1990s some jade companies also employed tunnelling and long wall mining (TANKS, 2016). Mine sites have not been closed or rehabilitated, and are currently abandoned or used as waste dumps (TANKS, 2016). This area has experienced several decades of mining. The environment can be characterised as heavily modified with extensive influence of jade mining.

### 6.1 Location and topography

The Hpakant/Lonkin Gems Tract is located in northern Myanmar approximately 350 km north of Mandalay. The area is located within Kachin State, Myitkyina District and Hpakant Township. Zone 1 is defined by the geographic coordinates (latitude and longitude) listed in Table 6.1.

**Table 6.1 Geographic coordinates of Zone 1**

Point	Long (DMS)	Lat (DMS)	Long (DM)	Lat (DM)
1	96° 21' 56.56" E	25° 40' 26.85" N	96° 21.943' E	25° 40.448' N
2	96° 15' 13.35" E	25° 40' 19.00" N	96° 15.223' E	25° 40.317' N
3	96° 15' 13.48" E	25° 42' 28.62" N	96° 15.225' E	25° 42.477' N
4	96° 17' 54.11" E	25° 44' 42.23" N	96° 17.902' E	25° 44.704' N
5	96° 21' 35.89" E	25° 44' 47.11" N	96° 21.598' E	25° 44.785' N
6	96° 22' 17.23" E	25° 43' 12.11" N	96° 22.287' E	25° 43.202' N

DMS – degrees, minutes and seconds; DM – degrees and decimal minutes

Zone 1 is located in the north of the Hpakant/Lonkin Gems Tract and is the largest zone to the west of Uru Creek. Uru Creek is a tributary of the Chindwin River, which is a tributary of the Ayeyarwady River which flows into the Andaman Sea. Steep-sided ridges and narrow valleys extend away from Uru Creek to the watershed with the adjacent catchment. Elevation ranges from 230 m at Uru Creek to 760 m at the watershed. The zone drains to Uru Creek via several tributary streams which have been highly modified by jade mining.

This zone is the most active for jade production in comparison to the other zones. After several decades of mining many areas have now been mined out, particularly the southern region abutting Zone 2 which has been heavily modified by mining operations.

Large-scale mining has resulted in large open pits reaching a depth up to 250 m, many with steep slopes and some filled with water forming pit lakes. Waste rock dumps cover most of the area. Settlements and villages occupy areas not required for mining including waste rock dumps. The northern and western regions of Zone 1 remain undisturbed and no active mining is occurring east of

Uru Creek. The western and northern areas of Zone 1 are largely undisturbed by mining activity and are characterised by steep hills and valleys with sparse forest cover.

## 6.2 Geology

Myanmar lies at the junction of two tectonic plates, the Indian Plate and the Burma Plate. The Indian Plate and Burma Plate abut at a tectonic feature called the Sunda megathrust. The Indian Plate is moving in a northerly direction under the Burma Plate at an average rate of 40 to 60 mm per year. The northward movement of the Indian Plate is causing stresses in the Central Andaman zone which is spreading apart at an average rate of 25 to 30 mm per year. The Sagaing Fault is the major tectonic feature of central Myanmar and the feature which releases some of the stresses associated with opening of the Central Andaman zone.

The four major tectonic provinces of Myanmar are north-south trending linear belts between the major fault lines. These are from east to west: Shan-Tanintharyi Block; Central Cenozoic Belt; Western Fold Belt and Rakhine Coastal Belt. Hpakan/Lonkin Gems Tract is located in the Shan-Tanintharyi Block and straddles the Sagaing Fault. The geology of the Hpakan/Lonkin Gems Tract (Figure 6.1) can be characterised as consisting of:

- Serpentinised peridotites forming the higher slopes and crests of hills and mountains.
- Crystalline schist on the lower slopes.
- Boulder conglomerate from the lower slopes and valleys extending east.
- Tertiary sedimentary rocks and Quaternary unconsolidated rocks and alluvium on the valleys to the east.

General stratigraphy of this zone is Tertiary sedimentary rocks and Quaternary unconsolidated rocks overlying the Uru Boulder Conglomerate. Bedrock underlies the Uru Boulder Conglomerate unit and is exposed in some areas.

Primary jadeite is found in dykes associated with Ultrabasic and Uru Boulder Conglomerate of Pleistocene age, as placer deposits. Secondary jadeite is found in the Uru Boulder Conglomerate and associated alluvial deposits. Secondary jadeite occurs as boulders, well-rounded stones and perfectly-rounded stones and is the key target for jade mining in the Hpakan/Lonkin Gems Tract. Large-scale and medium-scale mining is targeting the deeper deposits with small-scale and artisanal mining targeting the alluvial wash deposits. A cross section showing the occurrence of jadeite in dykes and the Uru Boulder Conglomerate is shown in Figure 6.2.

## 6.3 Climate, air quality and noise

The region is classified as a humid subtropical climate bordering on a tropical savanna climate. There is a dry season (November–April) and a wet season (May–October). Temperatures are very warm throughout the year, although the wet season months (December–February) are milder.

Weather data for Myitkyina, which is located 120 km east of Hpakan/Lonkin Gems Tract, is presented in Table 6.2. While local differences are expected, the general trends are expected to be similar. The highest average temperatures occur between March and October when averages are above 30°C. In the cooler months of November to March average minimum temperatures range from 10°C to 16°C. More than 90% of the rainfall occurs during the wet season, with most rain falling in June and July.

The air quality within the area is heavily influenced by mining activities. Traffic, drilling and blasting, and excavation and dumping of waste rock effect air quality principally through the generation of dust. Air quality is poorest in the dry season when the hot, dry conditions result in significant dust being generated from haul roads and excavation of overburden. Water is used to suppress dust on some village roads.

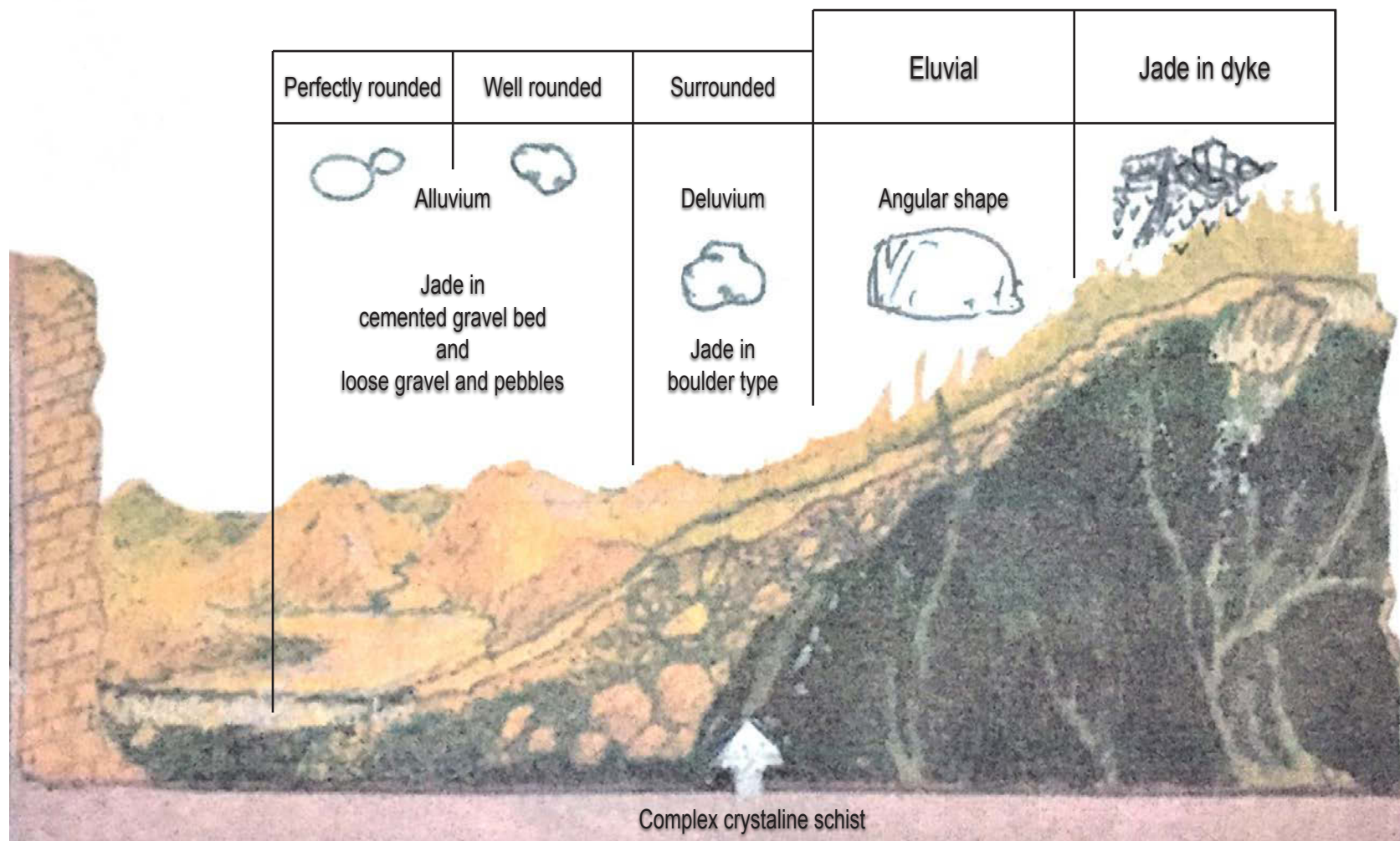
Noise and vibration are heavily influenced by mining activities. The main noise sources are mining equipment (excavators and drill rigs), haul trucks and blasting. Blasting is allowed at three times each day (7:00 am, 11:00 am and 4:00 pm); however, blasting was heard and is reported outside these times. No specific management of noise and vibration was observed from existing mine operators.

**Table 6.2 Climate statistics (Myitkyina)**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C	32	36.1	41.3	42.2	42.5	40.5	39.5	39.6	38	36.3	34.7	29.8	42.5
Average high °C	24.2	26.7	30	33.3	32.7	30.6	30	30.6	31.2	30.3	27.4	24.6	29.3
Average low °C	10.3	12.7	16.4	19.5	22.3	24.1	24.2	24.3	23.4	21.2	16	11.6	18.8
Record low °C	-0.1	3.4	4.8	9.9	12.5	16.4	18.5	19	15.6	9.4	5.3	2.1	-0.1
Average rainfall mm	8	18	26	46	159	535	513	411	285	158	28	9	2,196







## 6.4 Water

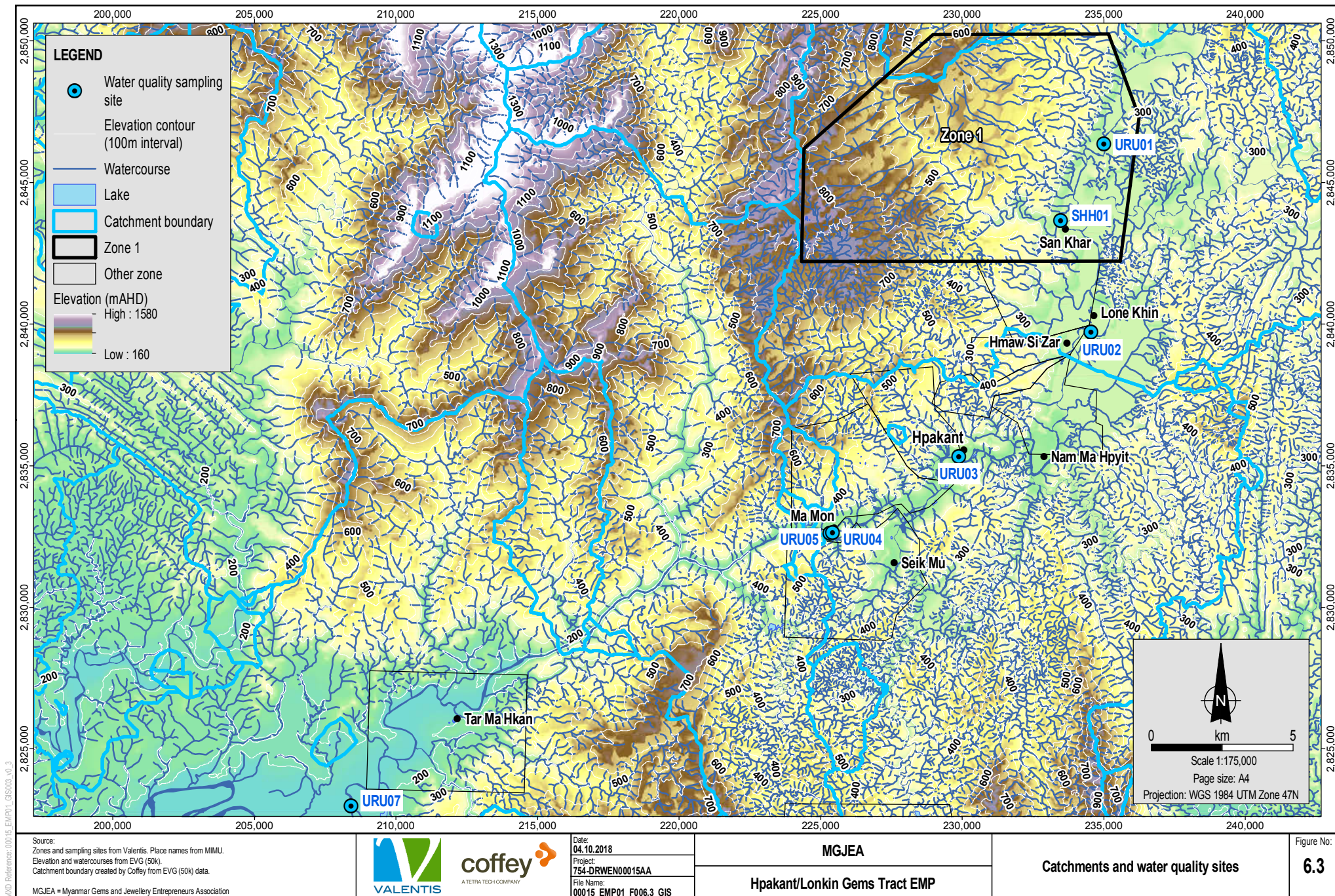
The Hpakant/Lonkin Gems Tract is located within the Chindwin River Basin that covers more than 110,350 km<sup>2</sup>. The basin originates in the Kachin plateau at approximately 3,800 m above sea level and joins the Ayeyarwady River some 900 km away at approximately 60 m above sea level. About 90% of the basin is heavily forested.

The Hpakant/Lonkin Gems Tract is bisected by the Uru Chaung (Uru Creek). The Uru Creek is a major tributary of the Chindwin River, which in turn is the largest tributary of Myanmar's largest river, the Ayeyarwady River. The source of the Uru Creek is in the Hukawng Valley. From there it flows in a southwesterly direction to join the Chindwin River near Homalin in Sagaing Region. The Hpakant/Lonkin Gems Tract is situated near the headwaters of the river.

Zone 1 is located within the Chindwin and Ayeyarwady (upper) catchments that drain the northern and western slopes into Uru Creek through a series of valleys of varying size. The largest watercourse is Uru Creek which flows 100 to 700 m away from the eastern boundary of Zone 1 in a north-south direction (Figure 6.3). Two smaller tributaries flow through this zone: the Sankha Chaung and Nam Sam stream. Sankha Chaung is 1700 m long and flows in a northwest to southeast direction. The Nam Sam stream flows from east to west. Both watercourses flow through the mining concessions before reaching Uru Creek. The streams are ephemeral and only flow during the wet season.

Watercourses in this zone are highly modified and are located within previously mined areas, active mining areas, and villages and settlements. A retaining wall has been constructed on the bank of Uru Creek (Plate 6.1) to constrain channel flows. Watercourse channels are cleaned out prior to the wet season to remove temporary crossings and debris from erosion and sedimentation. No permanent dams are located in Zone 1, although some former open mine pits have been flooded and are now permanently filled with water. Pit water is pumped out and discharged to the surrounding area at some sites.









Source: Valentis

**Plate 6.1 Retaining wall constructed on the banks of Uru Creek**

No erosion and sedimentation controls are in place. Catchment runoff generally flows into open pits, or is shed from disturbed surfaces eventually draining into watercourses. Erosion is extensive from mined faces and waste rock dumps. No cut-off drains were observed at the top of mine batters to divert surface water runoff away from mine batters. The Uru Creek and its two tributaries were observed to have high levels of suspended sediments and other debris, with infilling of the watercourse channel occurring. Sediment loads from Hpakant/Lonkin have migrated downstream to the Chindwin River and are affecting downstream users and aquatic habitats in Uru Creek and the Chindwin River.

The Directorate of Water Resources and Improvement of River Systems (DWIR) has prepared a master plan for Uru Creek. The plan details the reaches of the river where DWIR proposes works to improve channel flows and the navigability of the river through dredging, river training works and bank protection. The plan applies to the lower Uru Creek, with the most upstream works about 40 km river distance downstream of Zone 10.

Grey water and sewage from local communities is discharged through a canal to a storage pond which discharges to watercourses. Domestic wastes are disposed directly into watercourses. Several decades of artisanal mining and large-scale mining including direct disposal of overburden into watercourses has severely degraded watercourses.

In-situ water quality parameters that were collected during the site visit are presented in Table 6.3. Sample collection areas in Zone 1 (see Figure 6.3) showed visual evidence of foam and rubbish. Elevated suspended sediments and evidence of mining impacts were observed in water samples from other zones in the Hpakant/Lonkin Gems Tract.

**Table 6.3 In-situ water quality Zone 1**

Site	Latitude	Longitude	Watercourse and location	pH	Temp (°C)	EC (μS/cm)	DO (mg/L)	DO (% sat.)	Site conditions
SHH01	25° 41' 11.67" N	96° 20' 40.01" E	San Hka Hka. Downstream discharge from Zone 1.	8.24	32.1	161	5.8	83	Some water is blocked upstream, rubbish along the banks, stream flows parallel to road
URU01	25° 42' 32.19" N	96° 21' 18.14" E	Uru Creek. Upstream of Zones 1 to 8 and 10.	8.25	25.8	127	5.8	72	Close to the road, local voluntary group (green land) cleans the creek and rock retaining wall, some foam on surface of water.
URU02	25° 39' 6.43" N	96° 21' 22.02" E	Uru Creek. Downstream of Zones 1 to 2, upstream of zones 3 to 9 and 10.	8.23	29.9	152	5.32	80	Community area, rubbish along the banks, bathing place.
URU03	25° 36' 39.21" N	96° 18' 36.31" E	Uru Creek. Downstream of Zones 1 to 5, upstream of zones 6 to 8 and 10.	6.89	29	168	8.1	102	Excavating the soil sediment from the creek and discharged waste near the bridge, rubbishes, close to

									community area, grass growing on banks.
URU04	25° 35' 6.81" N	96° 15' 58.21" E	Uru Creek. Upstream of weir between Zones 7 and 8. Downstream of Zones 1 to 6. Upstream of Zone 10.	7.15	28.7	192	6.5	85	Temporary bridges that are used for dry season. The creek is dredged to ensure stream flow is maintained. Rubbish observed.
URU05	25° 35' 7.05" N	96° 15' 57.66" E	Uru Creek. Downstream of weir between Zones 7 and 8. Downstream of Zones 1 to 6. Upstream of Zone 10.	7.41	30.7	221	6.9	93	Close to Zone 7 discharge point (muddy water). Rubbish observed.
URU07	25° 29' 36.68" N	96° 5' 59.36" E	Uru Creek. Near downstream limit of Zone 10. Downstream of Zones 1 to 8.	8.37	28.9	157	5.5	74	Boats anchored in the bank, water turbid.

Temporary stream crossings have been constructed along the watercourses to enable traffic movements. In Zone 1, a crossing for light vehicles and haul trucks is provided at the Sankha Chaung stream (Plate 6.2). Temporary crossings were reported to be removed by 15 May every year. Some watercourse diversions are in place as well as the complete removal of smaller watercourses.

Uru Creek and its tributary streams have higher flows during the wet season which causes flooding of lower lying areas in and downstream of the zone. No major flooding was reported in Zone 1, although water runoff may impact downstream areas of Uru Creek due to higher water flow during the rainy season.

Mines in this zone intersect the groundwater table. Water collected in the open pit is pumped from the pit to adjacent watercourses or drainage lines.



Source: Soe Moe Kyaw Win

**Plate 6.2** Temporary culvert structure on the modified Sankha Chaung stream

## 6.5 Land use and biodiversity

Kachin State lies on the boundary of two of the World's most biologically rich and most threatened environments: the 'Indo-Burma', and 'Mountains of South Central China' hotspots.

The Northern Triangle Subtropical Forests [IM0140] are one of the least explored and scientifically known places in the world. The region's remote location, limited access, and rugged landscape have kept scientific exploration at a minimum. Yet what is known about these forests still ranks them as globally outstanding in their biological diversity.

Floristically, Kachin State in northern Myanmar is one of the most diverse regions in continental Asia, but it is also one of the least explored. The flora of the temperate forests is also extremely diverse, and the complex topography, together with moist conditions, has led to a high degree of plant endemism. This region consists primarily of the large area of subtropical broadleaf forest but includes

small, sub-regional-scale patches of temperate broadleaf forests and sub-alpine conifer forests. The subtropical forests are distributed roughly between 500 and 1,600 m above sea level. *Magnoliaceae*, *Lauraceae*, and *Dipterocarpaceae* species make up the associations below 915 m (WWF, 2017).

Several threatened species that make up part of this ecoregion's mammal fauna are also of conservation importance. These species include the tiger (*Panthera tigris*), red panda (*Ailurus fulgens*), Asian elephant (*Elephas maximus*), takin (*Budorcas taxicolor*), southern serow (*Naemorhedus sumatraensis*), pig-tailed macaque (*Macaca nemestrina*), Assamese macaque (*Macaca assamensis*), stump-tailed macaque (*Macaca arctoides*), capped leaf monkey (*Semnopithecus pileatus*), hoolock gibbon (*Hylobates hoolock*), Asiatic black bear (*Ursus thibetanus*), great Indian civet (*Viverra zibetha*), clouded leopard (*Pardofelis nebulosa*), red goral (*Naemorhedus baileyi*), Irrawaddy squirrel (*Callosciurus pygerythrus*), and particolored squirrel (*Hylopetes alboniger*) (WWF, 2017). The bird fauna of the region exceeds 370 species including one near-endemic species, the rusty-bellied shortwing (*Brachypteryx hyperythra*). These species are unlikely to occur in the Hpakant/Lonkin Gems Tract due to unsuitable habitat and/or deforestation.

The Uru Creek is listed as a key biodiversity area with importance to birds and reptiles. The Uru Creek is an important conservation area for the green peafowl (*Pavo muticus*), the spot-billed pelican (*Pelecanus philippensis*) and the white-rumped vulture (*Gyps bengalensis*).

The key biodiversity area in this region is the Indawgyi Wildlife Sanctuary, a Ramsar site (Beffasti and Galanti, 2011). The sanctuary is located in the Nam Ting and Indaw rivers catchments. These catchments share a common watershed with the Uru Creek catchment. Zone 1 is located 43 km north of the watershed between these catchments.

A range of threatened and endemic fish species are located within the upper Chindwin River Basin. Meynell and Gregory (undated) studied the aquatic fauna with Uru Creek and recorded more than 50 fish species including 20 used for subsistence use and 23 molluscs (Table 6.4). They reported that external stress level expected to be high because of mining.

**Table 6.4 Aquatic fauna in the Uru Creek**

Taxonomic group	Non-threatened	Near threatened and Vulnerable
Fishes	47	6
Molluscs	23	0
Dragonflies and damselflies	117	1
Crabs, lobsters and shrimps	1	0

Near threatened and vulnerable fish species found in the Uru Creek include the shortfin eel (*Anguilla bicolor*), butter catfish (*Ompok bimaculatus*), pengba fish (*Osteobrama belangeri*), wallago catfish (*Wallago attu*), *Garra compressa* and tiger botia (*Syncrossus berdmorei*).

Bhagwat et al (2017) mapped forest cover in Myanmar using Landsat satellite imagery to assess the condition and spatial distribution of Myanmar's intact and degraded forests with special focus on changes in intact forest between 2002 and 2014. They found that Hpakant/Lonkin was a local hotspot for intact forest loss with the area losing 39,089 ha or 0.8% intact forest cover change each year between 2002 and 2014.

Large areas of Zone 1 are undisturbed by mining operations, particularly in the north and west and along the eastern bank of Uru Creek. In these areas, forest is fragmented and patchy with substantial non-mining human-related disturbance evident. Slash and burn farming, for example, occurs in some surrounding hilly areas. Some animals such as snake, deer, and boar were reported to inhabit the forested areas.

Mining has occurred in the south and east of Zone 1, and continues there today (although to a lesser extent than previously). Forest ecosystems have been completely destroyed in areas that have been mined. Very limited and sparse vegetation occurs along the watercourses with only small trees and grasses present.

## 6.6 Social setting

Kachin State is the northernmost state of Myanmar. It is bordered by China to the north and east; Shan State to the south; and Sagaing Region and India to the west. The capital of the state is Myitkyina. Christianity is the main religion of Kachin State. Buddhism is the major religion among the Bamar immigrants and Shan people who live in Kachin State.

The Jingpho language was the traditional language of the area. The Bamar people were a minority in Kachin State before the independence of Burma from the British, but after 1948, groups of Bamar migrated to Kachin State to settle, which has caused a language shift and commenced the decline of the Kachin language. Some Kachin tribes speak and write their own language.

The economy of Kachin State is predominantly agricultural. The main products include rice, teak, sugar cane and opium. Mineral products include gold and jade.

Hpakant Township is the administrative centre of the Hpakant/Lonkin Gems Tract. The largest town in Hpakant Township is Kamaing, which is located approximately 40 km to the southeast of Hpakant. Based on the last census in 2014 (Wang and Myint, 2016), the total population of Hpakant Township was 312,278 (201,033 males and 111,245 females). These were classified as predominantly rural (252,155) with fewer people classified as urban (60,123). The number of reported conventional households was 33,134 (with 152,142 people) indicating a large proportion of the population (160,136) do not live in conventional households and are likely to be itinerant workers. There have also been reports that large numbers of people from other regions and states have migrated to the Hpakant/Lonkin Gems Tract.

There are three main villages in this zone. They are:

- Lone Khin.
- San Hkar.
- Ngo Pin.

San Hkar is located near the southeast boundary of Zone 1 (the eastern bank of Uru Creek). Demographic information for Zone 1 is provided in Table 6.5.

**Table 6.5 Demographics of this zone**

Area	Total	Permanent	Long term	Guest	Temporary
Houses/households	Not recorded	82	107	Not recorded	Not recorded



Villagers	934	418	421	Not recorded	95
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Some residential properties are located a few metres away from the mine sites. Villagers reported that land stability is a key issue in the region and some houses were in danger of land erosion from the waste rock dump. A large waste rock dump site is located along the eastern section of Uru Creek.

There is no formal reuse or recycling system. There is typically no community or government-managed waste collection service. Domestic waste and waste from worker accommodation is buried on site or mixed with waste rock and disposed in waste rock dumps.

The villagers' primary income is based on jade mining and jade scavenging through mine waste dumps.

Community infrastructure within this zone includes a school in the village next to San Hka and two private health clinics. Lone Khin provides more comprehensive health services. There are civil society organisations and groups such as Greenland which have helped with construction of the retaining wall along Uru Creek. The organisation Plaintiff discusses community issues with mining companies. Asian Harm Reduction Network and Medecins Sans Frontieres help run rehabilitation centres for drug users. A local fire brigade team composed of seven people and a social support team known as 'Myint Myat Thu' are trained in disaster relief efforts.

Several religious monuments are present within the zone. These include:

- Two churches.
- Two pagodas.
- One monastery.

Graveyards (which have been moved twice) are the most significant cultural feature in the zone.

Two archaeological sites are located in or near Zone 1. They are Kanchi and Minemaw-WayneKyum. Kanchi is located outside the zone, approximately 4 km northeast of the northern boundary of the zone. Artisanal and small-scale mining is occurring in the area around and Kanchi. Minemaw-WayneKyum is located in the northeastern corner of the zone and potentially exposed to disturbance from mining activities.

Kanchi, also known as Kansi, Ginsi and more recently Sengra, is the ruins of the grand haw or palace of the Ginsi (also known as Kansi) duwas near the town of Sengra. The haw consisted of 12 large magnificent brick buildings. They were built by Duwa Kansi La in 1897 and were a statement of the riches and power of the Ginsi jade lords who controlled the entire jade mining area at that time.

## 7 Potential impacts and mitigation

The mining methods described above impact the physical, biological, social and cultural environments. The impacts were identified by reviewing the hazards associated with artisanal and small-scale jade mining and linking the hazards with impact pathways and impact receptors. The hazard assessment is presented in this section, along with a discussion of the key impacts and mitigation. Mitigation is presented as the plans that contain the measures to manage the impacts.

### 7.1 Hazards and impact pathways

Artisanal and small-scale mining can degrade ecosystems and affect water quality through erosion, diversion, and consequential sedimentation of watercourses, contamination of water and soils, and pollution caused by inappropriate disposal of waste. Unstable excavations are a safety hazard and can limit effective use of land after mining has ceased. The location and nature of mining activities is a major factor in the potential for serious environmental damage, as well as for operational health and safety.

The sources of hazard, impact pathway and receptors are described in Table 7.1.

**Table 7.1 Artisanal and small-scale mining environmental hazards and impact pathways**

Hazard (source of impact)	Pathway	Impact and receptor
Mining operations and activity	Unsafe work practices	Injury or death from unstable excavations to mine workers, local communities and livestock.
Ground disturbance	Overland flow of air and water causing dust emissions, erosion and sedimentation of land and watercourses	<p>Reduced air quality due to dust.</p> <p>Reduced water quality due to increased sediments (TSS) impacting downstream beneficial uses (e.g., aquatic ecosystems and communities).</p> <p>Raised river beds due to deposited sediments increasing the likelihood of overbank flooding; deterioration of soil quality and fertility due to increased erosion.</p> <p>Reduced capacity for recovery of the native ecosystem.</p>
Deforestation	Clearing of forest, wetlands and vegetation	<p>Loss of habitat and soil and increased vulnerability of forest to invasive species (plants and animals).</p> <p>Loss of specialised and limited riparian forest zone which supports species adapted to the ecotone between drier forest and watercourses.</p> <p>Loss of wetlands.</p> <p>Loss or degradation of terrestrial and aquatic biodiversity.</p>
Watercourse obstructions	Flooding over river banks	Loss of life, crops and property from flooding of villages and community infrastructure.

Hazard (source of impact)	Pathway	Impact and receptor
		Loss or degradation of terrestrial and aquatic biodiversity.
Water jetting or sluicing of jade bearing formations	Runoff to watercourses causing erosion and sedimentation; runoff to mine voids creating stagnant water lakes or ponds	Reduced water quality. Degraded aquatic ecosystems. Poor health due to malaria- and dengue-carrying mosquitos and water-borne diseases from stagnant water.
Mine pits	Discharge of collected water (e.g., from severe rainfall event) to the receiving environment. Lack of backfilling.	Reduced water quality affecting people's health. Degraded aquatic ecosystems. Poor health due to malaria- and dengue-carrying mosquitos and water-borne diseases from stagnant water. Injury or death from drowning.
Hazardous materials	Poor management and/or disposal to watercourses and/or land causing contamination	Poor water quality and reduced productivity of soils affecting human and animal health. Degraded aquatic and terrestrial ecosystems.
Noise	Proximity to people, villages, settlements and animals	Sleep disturbance from night-time activities. Loss of amenity for residents. Alteration of animal habitats or migration patterns.
Inappropriate waste disposal	Stormwater runoff, watercourses and vermin	Reduced water quality; reduced soil productivity; vermin issues, including disease transmission by rats, bats and mosquitos to people, or from people to primates. Poor air and water quality and degraded soils from pollution. Social unrest associated with waste gathering.
Contaminated drinking water	Human use or consumption	Poor health from diseases, infections and allergies.
Drugs, alcohol and other addictive substances	Use and exposure to waste administering products	Injury, disease and social unrest.

## 7.2 Potential impacts and mitigation

The application of good practice will improve the environmental and social outcomes of artisanal and small-scale jade mining.

Environmental management of potential impacts must follow the mitigation hierarchy, as follows:

- Avoid impacts as far as possible;
- Where avoidance is not possible, minimise the impacts;

- Rehabilitate and restore any environmental damage; and
- Compensate environmental losses to ensure no overall loss, as a result of the mining activity.

Management measures and procedures to mitigate the impacts of artisanal and small-scale jade mining in the Hpakant/Lonkin Gems Tract are listed in this section under each potential impact. Section 7.4 details when the management measures are to be implemented – before mining, during mining and after mining.

The management measures detailed below and in Section 7.4 incorporate artisanal and small-scale-appropriate elements of the relevant notifications listed in Appendix 1 and are to be implemented in accordance with the notifications and the Myanmar Gemstone Law, as well as other relevant national laws.

### **Injury or death from unsafe work practices, unstable excavations and/or drowning**

Management measures to protect workers and communities from unsafe mining practices and unstable excavations are:

- Provide personal protective equipment (for example, clothing, boots, face masks, ear muffs, gloves and safety glasses) for the tasks being done, and that protects the health and safety of workers.
- Train workers in the safe use of hand tools and machinery, and the safe handling of hazardous chemicals (if used) and fuel.
- Ensure workers are healthy and fit for work, and not under the influence of drugs, alcohol or other additive substances.

Developing and maintaining good relationships with neighbouring concessions, land owners and communities will assist in alerting them to mining hazards and addressing their concerns.

- Consult with surrounding communities, keeping a record of whom was consulted, any concerns or objections they raised, and how those concerns or objections will be managed during mining.
- Maintain regular ongoing communication with surrounding communities, keeping a record of any concerns or objections raised, and how those concerns or objections have been managed.

Management measures to be implemented to leave a mine in a safe and environmentally responsible manner are:

- Remove all hand tools, equipment, machinery and buildings/shelters from the block or concession.
- Clean up and remove all non-hazardous waste to a common or community landfill.
- Clean up and remove all chemicals and hazardous materials (fuel, oil, grease and chemicals) from the site and dispose or arrange for disposal to a designated waste management area.
- Make the open pit or excavation safe by backfilling with overburden and waste rock, where practicable. Create a stable landform that will not erode.

- j. Reinststate any drainage lines or watercourses diverted during mining, where practicable. Ensure the reinstated drainage line or watercourse is stable through placement of rock to protect banks and flows.
- k. Spread salvaged topsoil over the reinstated landform.
- l. Spread cleared vegetation residue (brush and leaves) over the reinstated landform and topsoil to promote natural regeneration.
- m. Monitor reinstatement and revegetation every three months (and after storms and heavy rain events) for two years or until revegetation occurs. Repair any erosion or sedimentation of drainage lines and watercourses.

### **Loss or degradation of terrestrial and aquatic biodiversity from vegetation clearing and ground disturbance**

Management measures to minimise vegetation clearing and ground disturbance to protect terrestrial and aquatic biodiversity are:

- a. Prepare a mine plan (Figure 7.1) that accurately:
  - i. Defines the boundaries of the block or concession.
  - ii. Defines the area to be mined and area required for mine infrastructure including shelter, equipment storage, waste rock piles/dumps, sluice boxes and races, access, and cleared vegetation for reuse in revegetation.
  - iii. Identifies the drainage lines and watercourses in the catchment area that encompasses the block or concession.
  - iv. Identifies the location where water flowing from the mine site will discharge to a drainage line or watercourse.
  - v. Defines how the mine will be rehabilitated and closed.
- b. If defining the area to be mined and required for mine infrastructure seek to:
  - i. Avoid cultural heritage and religious sites.
  - ii. Avoid watercourses.
  - iii. Avoid sensitive forest, wetlands and habitat for threatened or endangered animals and plants.

Management measures to avoid, minimise vegetation clearing, loss or degradation of habitat, soil degradation and erosion are:

- c. Do not clear vegetation outside the area to be mined and area required for mine infrastructure.
- d. Clear vegetation in a safe manner, protecting, where possible, surrounding vegetation and watercourses.



- e. Clear vegetation slowly from the centre allowing wildlife time and opportunity to escape; clear around nests and wait until they are hatched before cutting down trees and shrubs.
- f. Clear vegetation as needed, retaining large trees where practicable (and safe to do so) to provide shade for workers, and to assist with natural regeneration when mining is finished.
- g. Recover any forest products from cleared vegetation including timber, firewood, medicinal plants, and seed for use in revegetation of the mine site.
- h. Do not burn cleared vegetation residue. Stockpile cleared vegetation residue for use in revegetation of the mine site.
- i. Do not clear vegetation within 50 m of a watercourse bank.
- j. Do not place overburden, waste rock or vegetation residues in watercourses.

#### **Loss or degradation of terrestrial and aquatic biodiversity from hazardous material contamination**

Chemicals and hazardous materials and waste includes fuel, oil, greases, hydraulic fluid, solvents, chemicals, used fuel, oil and grease containers, used hypodermic needles, and contaminated soil and water.

Management measures to properly handle, use and dispose of chemicals and hazardous materials to reduce impacts on terrestrial and aquatic biodiversity are:

- a. Keep only sufficient quantities of chemicals and hazardous materials for the required purpose.
- b. Do not purchase or accept chemicals and hazardous materials in unlabelled containers or packages.
- c. Store chemicals and hazardous materials in accordance with the instructions on the label. Do not store chemicals and hazardous materials within 50 m of a watercourse. Store chemicals and hazardous materials in a safe place away from people, living quarters, livestock or wildlife.
- d. Use only in the concentrations on the label.
- e. Use appropriate PPE when handling and using chemicals and hazardous materials.
- f. Train workers in the safe storage, handling, use and disposal of chemicals and hazardous materials.
- g. Dispose or arrange for disposal of chemicals and hazardous materials to a designated waste management area.

#### **Alteration of animal habitats or migration from noise**

Management measures to manage noise to reduce disturbance of people and wildlife are:

- a. Ensure mufflers are fitted to all equipment and machinery and maintain the mufflers in good working order.
- b. Limit work to daytime hours to avoid disturbing nearby houses, villages and settlements.

### **Loss of life, crops, property and community infrastructure from flooding**

Management measures to limit erosion and sedimentation of watercourses and protect life, crops, property and community infrastructure from flooding are:

- a. Do not clear vegetation within 50 m of a watercourse bank.
- b. Do not place overburden, waste rock or vegetation residues in watercourses.
- c. Prohibit the washing, servicing or refuelling of equipment, vehicles or machinery near or within watercourses.
- d. Store fuel and chemicals away from watercourses in secure areas.
- e. Maintain equipment and machinery in good working order to prevent fuel, grease and oil spills.
- f. Conduct mining activities during the dry season (November to May), where possible.
- g. Avoid clearing and excavation during storms and major rain events to limit erosion and sedimentation of drainage lines and watercourses.
- h. Construct cut-off drains around open pits to stop water draining into the pit.
- i. Direct cut-off drains to sediment traps (Figure 7.2) and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- j. Discharge pit water, mine site runoff and wastewater to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses. Construct diversion bunds to direct hydraulic jetting wash to sediment traps and silt fences (Figure 7.3).
- k. Direct runoff from waste rock piles and dumps to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- l. Design discharges from sediment traps to prevent scouring and erosion. Protect discharge channel with rocks.
- m. Regularly remove accumulated sediment from sediment traps and dispose in waste rock piles or dumps.
- n. Avoid diversion of drainage lines or streams unless required for mining. If diverted, reinforce constructed channel with rock to limit erosion. Install silt fences in diversion to limit sediment transport.

### **Reduced air quality from dust and burning waste**

Non-hazardous waste includes all packaging including plastic wrapping and cardboard, used water bottles, food scraps and utensils, used hypodermic needles, used tarpaulins, unusable hand tools, machines and equipment, domestic waste, any building materials, wastewater and human excrement.

Management measures to appropriately manage non-hazardous waste are:

- a. Follow the “4 Rs” rule – Reduce, Reuse, Recycle and Responsibly dispose of waste.
- b. Construct and maintain pit toilets away from watercourses and drainage lines.

- c. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.
- d. Separate reusable and recyclable waste from other waste. Recyclable waste includes plastic drink bottles and steel.
- e. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.
- f. Do not dispose of hazardous materials or hazardous waste with non-hazardous waste.
- g. Do not burn non-hazardous waste including oils, greases, plastics, and polystyrene foam.

#### **Reduced water quality from sedimentation and pollution from waste**

Management measures to limit erosion and sedimentation of watercourses and pollution from hazardous and non-hazardous wastes are:

- a. Do not clear vegetation within 50 m of a watercourse bank.
- b. Do not place overburden, waste rock or vegetation residues in watercourses.
- c. Prohibit the washing, servicing or refuelling of equipment, vehicles or machinery near or within watercourses.
- d. Store fuel and chemicals away from watercourses in secure areas.
- e. Maintain equipment and machinery in good working order to prevent fuel, grease and oil spills.
- f. Conduct mining activities during the dry season (November to May), where possible.
- g. Avoid clearing and excavation during storms and major rain events to limit erosion and sedimentation of drainage lines and watercourses.
- h. Construct cut-off drains around open pits to stop water draining into the pit.
- i. Direct cut-off drains to sediment traps (Figure 7.2) and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- j. Discharge pit water, mine site runoff and wastewater to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses. Construct diversion bunds to direct hydraulic jetting wash to sediment traps and silt fences (Figure 7.3).
- k. Direct runoff from waste rock piles and dumps to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- l. Design discharges from sediment traps to prevent scouring and erosion. Protect discharge channel with rocks.
- m. Regularly remove accumulated sediment from sediment traps and dispose in waste rock piles or dumps.

- n. Avoid diversion of drainage lines or streams unless required for mining. If diverted, reinforce constructed channel with rock to limit erosion. Install silt fences in diversion to limit sediment transport.

Non-hazardous waste includes all packaging including plastic wrapping and cardboard, used water bottles, food scraps and utensils, used hypodermic needles, used tarpaulins, unusable hand tools, machines and equipment, domestic waste, any building materials, wastewater and human excrement.

Management measures to appropriately manage non-hazardous waste are:

- o. Follow the “4 Rs” rule – Reduce, Reuse, Recycle and Responsibly dispose of waste.
- p. Construct and maintain pit toilets away from watercourses and drainage lines.
- q. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.
- r. Separate reusable and recyclable waste from other waste. Recyclable waste includes plastic drink bottles and steel.
- s. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.
- t. Do not dispose of hazardous materials or hazardous waste with non-hazardous waste.
- u. Do not burn non-hazardous waste including oils, greases, plastics, and polystyrene foam.

Chemicals and hazardous materials and waste includes fuel, oil, greases, hydraulic fluid, solvents, chemicals, used fuel, oil and grease containers, used hypodermic needles, and contaminated soil and water.

Management measures to properly handle, use and dispose of chemicals and hazardous materials are:

- v. Keep only sufficient quantities of chemicals and hazardous materials for the required purpose.
- w. Do not purchase or accept chemicals and hazardous materials in unlabelled containers or packages.
- x. Store chemicals and hazardous materials in accordance with the instructions on the label. Do not store chemicals and hazardous materials within 50 m of a watercourse. Store chemicals and hazardous materials in a safe place away from people, living quarters, livestock or wildlife.
- y. Use only in the concentrations on the label.
- z. Use appropriate PPE when handling and using chemicals and hazardous materials.
- aa. Train workers in the safe storage, handling, use and disposal of chemicals and hazardous materials.
- bb. Dispose or arrange for disposal of chemicals and hazardous materials to a designated waste management area.

Management measures to protect topsoil for reuse in revegetation and limit erosion and sedimentation of watercourses are:

- cc. Excavate and stockpile topsoil separate to overburden and waste rock.
- dd. Protect topsoil stockpiles with brush (clearing residue) to limit erosion and to create seed bank.

### **Reduced soil productivity from hazardous materials and waste**

Non-hazardous waste includes all packaging including plastic wrapping and cardboard, used water bottles, food scraps and utensils, used hypodermic needles, used tarpaulins, unusable hand tools, machines and equipment, domestic waste, any building materials, wastewater and human excrement.

Management measures to appropriately manage non-hazardous waste are:

- a. Follow the “4 Rs” rule – Reduce, Reuse, Recycle and Responsibly dispose of waste.
- b. Construct and maintain pit toilets away from watercourses and drainage lines.
- c. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.
- d. Separate reusable and recyclable waste from other waste. Recyclable waste includes plastic drink bottles and steel.
- e. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.
- f. Do not dispose of hazardous materials or hazardous waste with non-hazardous waste.
- g. Do not burn non-hazardous waste including oils, greases, plastics, and polystyrene foam.

Chemicals and hazardous materials and waste includes fuel, oil, greases, hydraulic fluid, solvents, chemicals, used fuel, oil and grease containers, used hypodermic needles, and contaminated soil and water.

Management measures to properly handle, use and dispose of chemicals and hazardous materials are:

- h. Keep only sufficient quantities of chemicals and hazardous materials for the required purpose.
- i. Do not purchase or accept chemicals and hazardous materials in unlabelled containers or packages.
- j. Store chemicals and hazardous materials in accordance with the instructions on the label. Do not store chemicals and hazardous materials within 50 m of a watercourse. Store chemicals and hazardous materials in a safe place away from people, living quarters, livestock or wildlife.
- k. Use only in the concentrations on the label.
- l. Use appropriate PPE when handling and using chemicals and hazardous materials.



- m. Train workers in the safe storage, handling, use and disposal of chemicals and hazardous materials.
- n. Dispose or arrange for disposal of chemicals and hazardous materials to a designated waste management area.

#### **Loss of amenity and sleep disturbance from noise**

Management measures to manage noise to reduce disturbance of people and wildlife are:

- a. Ensure mufflers are fitted to all equipment and machinery and maintain the mufflers in good working order.
- b. Limit work to daytime hours to avoid disturbing nearby houses, villages and settlements.

#### **Poor health due to mosquito and water-borne diseases**

Management measures to appropriately manage non-hazardous waste to protect people from mosquito and water-borne diseases are:

- a. Construct and maintain pit toilets away from watercourses and drainage lines.
- b. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.
- c. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.

#### **Poor health due to disease transmission by rats, bats and other vermin**

Non-hazardous waste includes all packaging including plastic wrapping and cardboard, used water bottles, food scraps and utensils, used hypodermic needles, used tarpaulins, unusable hand tools, machines and equipment, domestic waste, any building materials, wastewater and human excrement.

Management measures to appropriately manage non-hazardous waste to protect people from rats, bats and other vermin are:

- a. Follow the “4 Rs” rule – Reduce, Reuse, Recycle and Responsibly dispose of waste.
- b. Construct and maintain pit toilets away from watercourses and drainage lines.
- c. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.
- d. Separate reusable and recyclable waste from other waste. Recyclable waste includes plastic drink bottles and steel.
- e. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.
- f. Do not burn non-hazardous waste including oils, greases, plastics, and polystyrene foam.

### **Poor health due to exposure to hazardous materials and waste**

Chemicals and hazardous materials and waste includes fuel, oil, greases, hydraulic fluid, solvents, chemicals, used fuel, oil and grease containers, used hypodermic needles, and contaminated soil and water.

Management measures to properly handle, use and dispose of chemicals and hazardous materials are:

- a. Keep only sufficient quantities of chemicals and hazardous materials for the required purpose.
- b. Do not purchase or accept chemicals and hazardous materials in unlabelled containers or packages.
- c. Store chemicals and hazardous materials in accordance with the instructions on the label. Do not store chemicals and hazardous materials within 50 m of a watercourse. Store chemicals and hazardous materials in a safe place away from people, living quarters, livestock or wildlife.
- d. Use only in the concentrations on the label.
- e. Use appropriate PPE when handling and using chemicals and hazardous materials.
- f. Train workers in the safe storage, handling, use and disposal of chemicals and hazardous materials.
- g. Dispose or arrange for disposal of chemicals and hazardous materials to a designated waste management area.

### **Social unrest from drugs, alcohol, other addictive substances and waste gathering**

Artisanal and small-scale miners will maintain good relations with their workers and communities by requiring workers to act responsibly and by engaging with communities and addressing their concerns. The management measures that must be implemented to maintain good relations and protect workers and communities from associated impacts are:

- a. Implement the responsibilities set out in Section 9.2.
- b. Consult with surrounding communities, keeping a record of whom was consulted, any concerns or objections they raised, and how those concerns or objections will be managed during mining.
- c. Maintain regular ongoing communication with surrounding communities, keeping a record of any concerns or objections raised, and how those concerns or objections have been managed.

## **7.3 Management measures by mining phase**

This section sets out when (mining phases) the management measures and procedures detailed in Section 7.3 need to be implemented. They are:

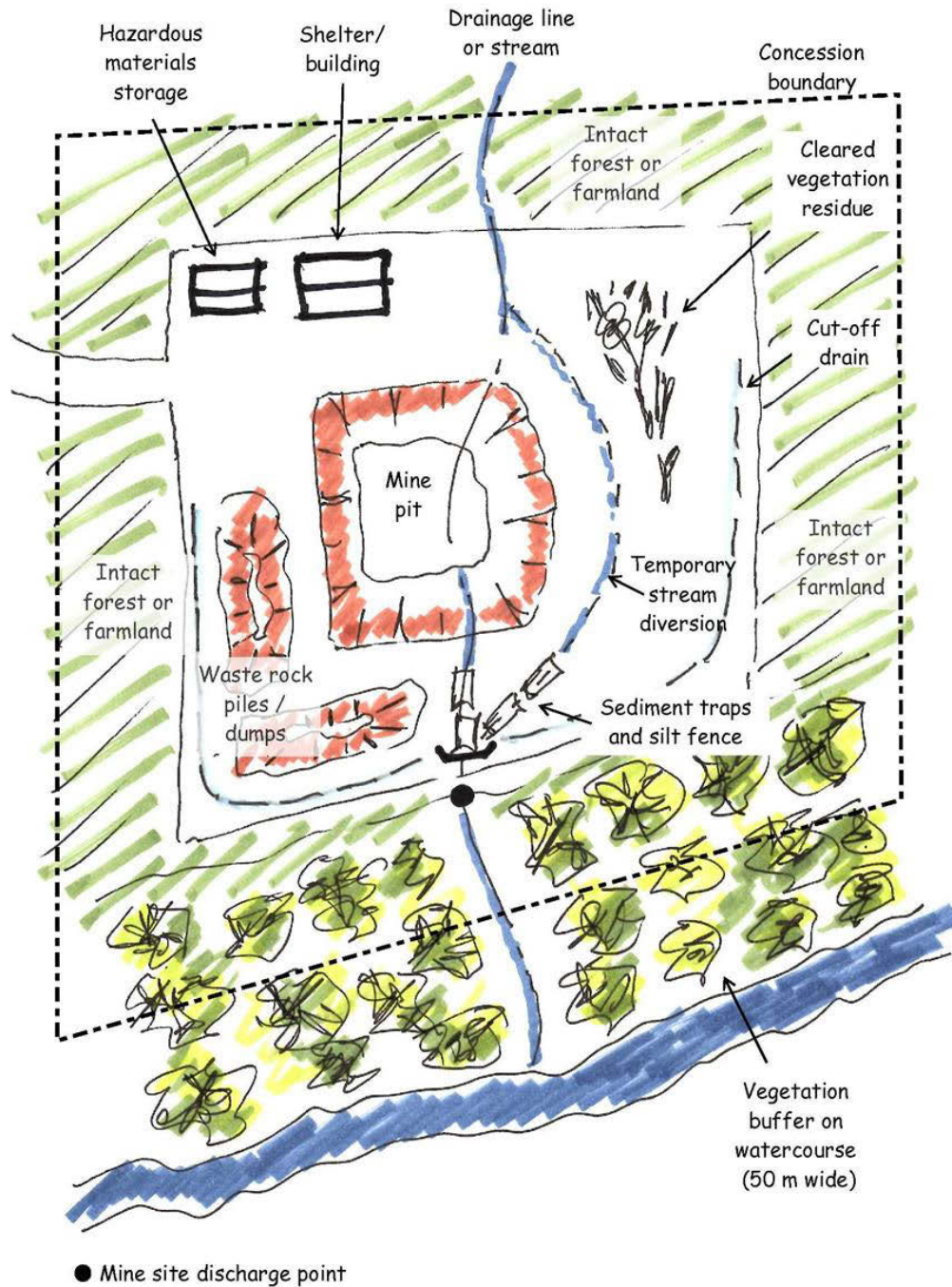
- Before mining – to ensure proper planning for environmental and social management of mining activities.
- During mining – to ensure mining activities avoid, minimise, reduce and compensate for environmental and social impacts.

- After mining – to ensure mine sites are properly rehabilitated and the final land use has regard to community views.

### 7.3.1 Before mining

The following management measures must be done before mining commences:

- a. Prepare a mine plan (Figure 7.1) that accurately:
  - i. Defines the boundaries of the block or concession.
  - ii. Defines the area to be mined and area required for mine infrastructure including shelter, equipment storage, waste rock piles/dumps, sluice boxes and races, access, and cleared vegetation for reuse in revegetation.
  - iii. Identifies the drainage lines and watercourses in the catchment area that encompasses the block or concession.
  - iv. Identifies the location where water flowing from the mine site will discharge to a drainage line or watercourse.
  - v. Defines how the mine will be rehabilitated and closed.
- b. If defining the area to be mined and required for mine infrastructure seek to:
  - i. Avoid cultural heritage and religious sites.
  - ii. Avoid watercourses.
  - iii. Avoid sensitive forest, wetlands and habitat for threatened or endangered animals and plants.
- c. Provide personal protective equipment (for example, clothing, boots, face masks, ear muffs, gloves and safety glasses) for the tasks being done, and that protects the health and safety of workers.
- d. Train workers in the safe use of hand tools and machinery, and the safe handling of hazardous chemicals (if used) and fuel.
- e. Ensure workers are healthy and fit for work, and not under the influence of drugs, alcohol or other additive substances.
- f. Consult with surrounding communities, keeping a record of whom was consulted, any concerns or objections they raised, and how those concerns or objections will be managed during mining.



**Figure 7.1 Conceptual layout of artisanal or small-scale mine site**

### **7.3.2 During mining**

The management measures that apply to mining activities are set out in the following sections.

#### **Managing vegetation clearing**

Management measures to avoid, minimise vegetation clearing, loss or degradation of habitat, soil degradation and erosion are:

- a. Do not clear vegetation outside the area to be mined and area required for mine infrastructure.
- b. Clear vegetation in a safe manner, protecting, where possible, surrounding vegetation and watercourses.
- c. Clear vegetation slowly from the centre allowing wildlife time and opportunity to escape; clear around nests and wait until they are hatched before cutting down trees and shrubs.
- d. Clear vegetation as needed, retaining large trees where practicable (and safe to do so) to provide shade for workers, and to assist with natural regeneration when mining is finished.
- e. Recover any forest products from cleared vegetation including timber, firewood, medicinal plants, and seed for use in revegetation of the mine site.
- f. Do not burn cleared vegetation residue. Stockpile cleared vegetation residue for use in revegetation of the mine site.

#### **Protecting and salvaging topsoil**

Management measures to protect topsoil for reuse in revegetation are:

- g. Excavate and stockpile topsoil separate to overburden and waste rock.
- h. Protect topsoil stockpiles with brush (clearing residue) to limit erosion and to create seed bank.

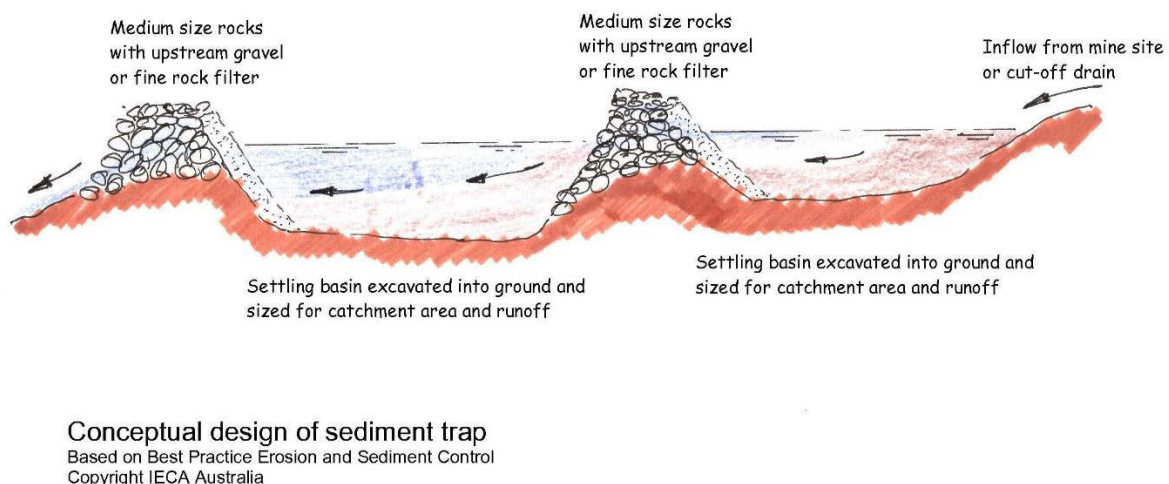
#### **Protecting watercourses**

Management measures to protect watercourse and limit erosion and sedimentation are:

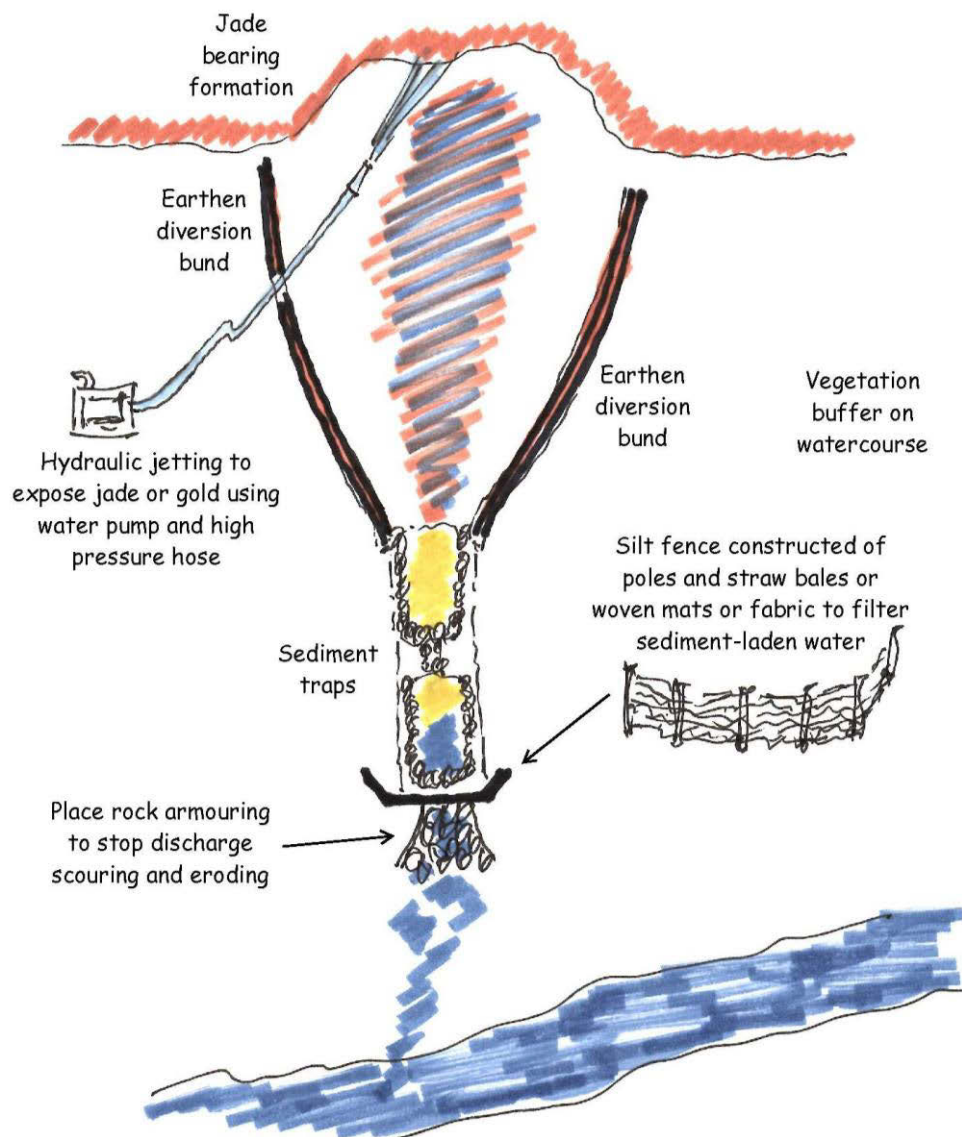
- i. Do not clear vegetation within 50 m of a watercourse bank.
- j. Do not place overburden, waste rock or vegetation residues in watercourses.
- k. Prohibit the washing, servicing or refuelling of equipment, vehicles or machinery near or within watercourses.
- l. Store fuel and chemicals away from watercourses in secure areas.
- m. Maintain equipment and machinery in good working order to prevent fuel, grease and oil spills.
- n. Conduct mining activities during the dry season (November to May), where possible.



- o. Avoid clearing and excavation during storms and major rain events to limit erosion and sedimentation of drainage lines and watercourses.
- p. Construct cut-off drains around open pits to stop water draining into the pit.
- q. Direct cut-off drains to sediment traps (Figure 7.2) and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- r. Discharge pit water, mine site runoff and wastewater to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses. Construct diversion bunds to direct hydraulic jetting wash to sediment traps and silt fences (Figure 7.3).
- s. Direct runoff from waste rock piles and dumps to sediment traps and silt fences to allow sediment to settle before discharging to drainage lines or watercourses.
- t. Design discharges from sediment traps to prevent scouring and erosion. Protect discharge channel with rocks.
- u. Regularly remove accumulated sediment from sediment traps and dispose in waste rock piles or dumps.
- v. Avoid diversion of drainage lines or streams unless required for mining. If diverted, reinforce constructed channel with rock to limit erosion. Install silt fences in diversion to limit sediment transport.



**Figure 7.2 Conceptual design of sediment trap**



**Figure 7.3 Conceptual layout of erosion and sediment control for hydraulic jetting operation**

## Managing non-hazardous waste

Non-hazardous waste includes all packaging including plastic wrapping and cardboard, used water bottles, food scraps and utensils, used hypodermic needles, used tarpaulins, unusable hand tools, machines and equipment, domestic waste, any building materials, wastewater and human excrement.

Management measures to appropriately manage non-hazardous waste are:

- w. Follow the “4 Rs” rule – Reduce, Reuse, Recycle and Responsibly dispose of waste.
- x. Construct and maintain pit toilets away from watercourses and drainage lines.
- y. Collect all waste and store in secure containers to avoid birds and animals picking through the waste and carrying it off.

- z. Separate reusable and recyclable waste from other waste. Recyclable waste includes plastic drink bottles and steel.
- aa. Regularly remove waste from the mine site. Deposit waste in designated common or community landfills. Arrange collection or deliver recyclable waste to recycling facilities if they exist, otherwise dispose to designated landfill.
- bb. Do not dispose of hazardous materials or hazardous waste with non-hazardous waste.
- cc. Do not burn non-hazardous waste including oils, greases, plastics, and polystyrene foam.

## **Managing chemicals and hazardous materials**

Chemicals and hazardous materials and waste includes fuel, oil, greases, hydraulic fluid, solvents, chemicals, used fuel, oil and grease containers, used hypodermic needles, and contaminated soil and water.

Management measures to properly handle, use and dispose of chemicals and hazardous materials are:

- dd. Keep only sufficient quantities of chemicals and hazardous materials for the required purpose.
- ee. Do not purchase or accept chemicals and hazardous materials in unlabelled containers or packages.
- ff. Store chemicals and hazardous materials in accordance with the instructions on the label. Do not store chemicals and hazardous materials within 50 m of a watercourse. Store chemicals and hazardous materials in a safe place away from people, living quarters, livestock or wildlife.
- gg. Use only in the concentrations on the label.
- hh. Use appropriate PPE when handling and using chemicals and hazardous materials.
- ii. Train workers in the safe storage, handling, use and disposal of chemicals and hazardous materials.
- jj. Dispose or arrange for disposal of chemicals and hazardous materials to a designated waste management area.

## **Managing noise**

Management measures to manage noise to reduce disturbance of people and wildlife are:

- kk. Ensure mufflers are fitted to all equipment and machinery and maintain the mufflers in good working order.
- ll. Limit work to daytime hours to avoid disturbing nearby houses, villages and settlements.

## **Working with neighbours and communities**

Maintaining a relationship with neighbouring concessions, land owners and communities is important.

mm. Maintain regular ongoing communication with surrounding communities, keeping a record of any concerns or objections raised, and how those concerns or objections have been managed.

### **7.3.3 After mining**

Management measures to be implemented to leave a mine in a safe and environmentally responsible manner are:

- a. Remove all hand tools, equipment, machinery and buildings/shelters from the block or concession.
- b. Clean up and remove all non-hazardous waste to a common or community landfill.
- c. Clean up and remove all chemicals and hazardous materials (fuel, oil, grease and chemicals) from the site and dispose or arrange for disposal to a designated waste management area.
- d. Make the open pit or excavation safe by backfilling with overburden and waste rock, where practicable. Create a stable landform that will not erode.
- e. Reinstate any drainage lines or watercourses diverted during mining, where practicable. Ensure the reinstated drainage line or watercourse is stable through placement of rock to protect banks and flows.
- f. Spread salvaged topsoil over the reinstated landform.
- g. Spread cleared vegetation residue (brush and leaves) over the reinstated landform and topsoil to promote natural regeneration.
- h. Monitor reinstatement and revegetation every three months (and after storms and heavy rain events) for two years or until revegetation occurs. Repair any erosion or sedimentation of drainage lines and watercourses.

## **7.4 Performance criteria**

The performance criteria for artisanal and small-scale mining are:

- No evidence of inappropriate or unnecessary clearing of vegetation.
- No evidence of unreasonable levels of sedimentation of watercourses from mining-related activities.
- No evidence of soil or water contamination from chemicals or hazardous materials.
- Evidence of successful rehabilitation and revegetation of mine site.
- Community grievances addressed.

## 8 Public participation and consultation

This EMP has been informed by extensive consultation with a diverse range of stakeholders and the advisory group. The consulted stakeholders include governments, ministries, departments, organisations and people who are involved in the jade mining industry, who regulate the industry and who seek improved regulation and environmental and social performance.

### 8.1 Stakeholders

Formal briefings and meetings have been held with the following stakeholders:

#### ***Myanmar Government, ministries and departments***

- Union Government Upper House Natural Resources Management Committee.
- Union Government Parliamentary Member for Hpakant.
- Kachin State Government Cabinet including Chief Minister.
- Kachin State Government Minister for Natural Resources and Environmental Conservation.
- Department of Mines (Nay Pyi Taw).
- Environmental Conservation Department (Nay Pyi Taw).
- Environmental Conservation Department (Myitkyina).
- Myanmar Gems Enterprise (Nay Pyi Taw).
- Myanmar Gems Enterprise (Myitkyina).

#### ***Jade mining organisation and mining companies***

- Myanmar Gems and Jewellery Entrepreneurs Association.
- MGJEA members.

#### ***Non-government and civil society organisations and individuals***

- Myanmar Centre for Responsible Business.
- Natural Resources Governance Institute.
- World Bank Extractive Industries Transparency Initiative.
- World Bank Extractive Industries Transparency Initiative (Mining tenure reform).
- Myanmar Alliance for Transparency and Accountability.
- Transparency and Accountability Network Kachin State.
- Kachin Development Networking Group.
- Karuna Mission Social Solidarity.
- Wildlife Conservation Society.
- Emma Irwin, Independent consultant.
- Matthew Baird, Environmental law advisor (to Environmental Conservation Department).

#### ***Foreign governments***

- BGR Sustainable Development of the Mining Sector in Myanmar (mining inspector training).
- American Embassy.
- Australian Embassy.



### **Other organisations**

- Kachin Independence Organisation (Technical Office, Myitkyina).
- Tatmadaw. Attempts to brief the Northern Commander-in-Chief have been unsuccessful. Information presented to the listed stakeholders has been sent to the Commander-in-Chief to keep him fully informed.

### **Hpakant/Lonkin local administration and communities**

Representative members of local administration and villages were consulted during the environmental audit field trip to Hpakant/Lonkin. The people consulted in this zone are listed in Table 8.1.

**Table 8.1 List of community members consulted in this zone**

Name	Native	Nationality	Village	Designation	Resident since
Villager from Lone Khin	Not recorded	Kachin	Lone Khin	Head of Administration	Native
Villager from San Hkar	Not recorded	Myanmar	San Hkar	Head of 100-Households	1992
Villager from Ngo Pin	Not recorded	Myanmar	Ngo Pin	Head of 100-Households	1991

## **8.2 Stakeholder issues**

The stakeholders consulted raised a wide range of issues and concerns, many outside the scope of this EMP. The issues relevant to the environmental and social performance of the jade mining industry are:

- Effective environmental management. Environmental management at Hpakant/Lonkin is ineffective despite numerous letters and notifications requiring environmental management of jade mining activities being issued by MGE.
- Environmental management mechanism. The mechanism or process for requiring and regulating environmental management is unclear leading to confusion about responsibilities and obligations.
- Capacity of MGE, Department of Mines and ECD to regulate environmental and social management of jade mining activities.
- Knowledge, experience and capacity of mining companies to implement environmental and social management of their mining activities.
- Significant impacts caused by large-scale and medium-scale mining activities. Legacy issues from small-scale and artisanal mining.
- Lack of environmental controls at mines leading to significant impacts on biodiversity and water resources and water quality through land clearing for mines and reclamation for waste rock dumps, and erosion and sedimentation of rivers, creeks and streams.
- Flooding as a result of infilling of watercourse channels with sediment, leading to loss of property and crop damage.
- Dust during the dry season contributing to health effects including respiratory infections.

- Property damage and sleep disturbance from blasting.
- Amenity and safety concerns about mining equipment using roads in villages and settlements.
- Inappropriate waste disposal contaminating soil and water and leading to health effects including gastrointestinal diseases, mosquito or rodent transmitted diseases, and other illnesses.
- Social impacts of drug use including crime and health effects.
- Social impacts associated with resettlement of villages and informal settlements.
- Mine closure and final land use.

The specific issues raised by village and community members in this zone are listed in Table 8.2.

**Table 8.2 Summary of community views in this zone**

Aspect	Summary of community views
Economic	<ul style="list-style-type: none"> <li>• Jade mining is the main source of household income.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Drug use is the major issue.</li> <li>• Crime issues are related to drug use, e.g., theft.</li> <li>• Hearing loss associated with heavy blasting is a concern.</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• Traffic and road accidents is the main concern.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Land stability is the major issue as mine sites are close to residential areas.</li> <li>• Flooding is an issue especially in the rainy season as some tributaries are partially blocked by waste rock.</li> <li>• Dust is an issue during mining operations.</li> <li>• Community is concerned about the availability of water.</li> <li>• There have been past issues with pests and feral animals.</li> </ul>

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## **9 Implementation**

This section sets out the responsibility for implementation of this EMP and appropriate behaviour expected of artisanal and small-scale miners.

### **9.1 Responsibility for implementation of this EMP**

The mine owner is responsible for the implementation of this plan and must adequately resource environmental management of the mining activities. All workers must be trained in the requirements of this plan. All workers are responsible for ensuring that their work complies with the conditions of all relevant legislation, the management measures and procedures outlined in the EMP, and any relevant directive, notification, order or Environmental Compliance Certificate issued by ECD.

### **9.2 Responsibilities and appropriate behaviour**

Artisanal and small-scale miners must act responsibly, and are required to:

- a. Comply with all enacted Myanmar laws and rules, and with all guidelines and standards.
- b. Comply with all orders, directives and notifications issued by the Minister for Mines, his delegate or the Myanmar Gems Enterprise Department of Jade Mining.
- c. Comply with this EMP.
- d. Act with care and integrity at all times.
- e. Be mindful of real, potential and perceived conflicts of interest and act in a transparent manner.
- f. Treat each other and all members of the community with respect, dignity and consideration at all times.
- g. Not engage in behaviours that offend, intimidate or discriminate on gender, race or religion.
- h. Not engage in any activities involving bribery, corruption, payment of secret commissions or exercise of improper influence under any circumstances.
- i. Respect and where required protect cultural heritage and religious sites from disturbance.
- j. Respect the rights of landowners.
- k. Not make, use or distribute drugs, alcohol or other addictive substances.
- l. Not carry, use or trade weapons including firearms and explosive devices.
- m. Not carry, use or trade items banned by Myanmar laws or rules, orders, directives or notifications.
- n. Not wear military green or green camouflage uniforms.
- o. Not litter or discard syringes or other hazardous materials and items.
- p. Dispose of all waste in proper waste disposal containers or facilities.
- q. Not harass, hunt, capture, keep as pets, sell or trade protected wildlife.

### **9.3 Indicative implementation budget**

Implementation of the EMP requires allocation of funds for PPE, training and management of chemicals, hazardous materials and waste. The estimated cost to implement the ASM EMP is presented in Table 9.1. The estimated costs do not include the cost of constructing facilities and structures such as sediment basins.



**Table 9.1 Estimated cost to implement EMP**

EMP component	Task	Responsibility/resource	Estimated cost USD	Estimated cost MMK*
EMP	Implementation of EMP	Mine owner/manager	200	273,200
Management of chemicals and hazardous materials	Provision of separate storage areas	Mine owner/manager	100	136,600
Management of chemicals and hazardous materials	Disposal of chemicals and hazardous waste	Mine owner/manager	100	136,600
Management of community grievances	Adhoc meetings with communities to resolve disputes and grievances	Mine owner/manager	100	136,600
Support for community projects	Contributions to community projects	Mine owner/manager	200	273,200
Access to land	Dependent on land to be acquired and fair and equitable compensation	Mine owner/manager	-	-
Management of non-hazardous waste	Disposal of waste in landfill; monthly local administration cost	Mine owner/manager	300	409,800
Management of worker health and safety	Fit for work medical check-up for all existing workers	Mine owner/manager	500	683,000
Management of worker health and safety	Provision of PPE and training in its use	Mine owner/manager	125	170,750
Management of worker health and safety	Provision of first aid equipment and training in its use	Mine owner/manager	100	136,600
		<b>Estimated total once-off cost</b>	<b>725</b>	<b>990,350</b>
		<b>Estimated total annual cost</b>	<b>1,000</b>	<b>1,366,000</b>

\* Average exchange rate from June 2017 to June 2018 USD1 = MMK1,336

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## 10 Monitoring and inspection requirements

The mine owner or a delegated worker is responsible for regular inspection, monitoring and reporting of ASM activities. The mine owner must maintain records of the inspection and monitoring (compliance checklist) and make those records available to relevant authorities on request.

Erosion and sediment control structures will be regularly inspected and discharge water quality regularly monitored to ensure they are being installed, properly constructed and properly maintained. Discharge water quality will be determined by visual inspection of the discharge. If the discharge is relatively clear and the bed material is visible, the water quality is likely to be acceptable.

Soil and water contamination will be determined by visual inspection of the mine site and surrounding land for:

- Staining of soils from fuel, oil and grease.
- Oily sheens on water in ponds and watercourses.
- Odour from fuel and chemical vapours.
- Discoloured water indicating chemical or other hazardous material contamination.
- Waste in watercourses.

Successful rehabilitation and revegetation of the mine site will be determined by:

- No discarded equipment or machinery.
- All buildings and structures removed.
- Stable landform.
- Plants growing strongly and few or no areas of ineffective or incomplete revegetation.

Compliance will be determined using the checklist attached to this plan.

### 10.1 Frequency and duration of monitoring

The frequency of inspections is set out in Table 10.1.

**Table 10.1 Frequency of inspection and monitoring**

Activity	Frequency
Layout of mine	Prior to mining commencing
Surface water management	Prior to mining commencing
Erosion and sediment control structures	Monthly during dry season; weekly during wet season; after storms or heavy rainfall
Discharge water quality	Monthly
Hazardous materials management	Monthly
Soil and water contamination	Monthly
Rehabilitation and revegetation	Three monthly for two years and after storms and major rain events

### 10.2 Estimated cost

The cost of inspection and monitoring is the time cost of the mine owner or delegated employee doing the inspection and monitoring.

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## **11 Reporting requirements**

The mine owner will report compliance with the ASM EMP through provision of the compliance checklists on request.

### **Incident reporting**

The mine owner will report serious incidents to MGE and obey the instructions of MGE in managing and investigating the incident.

The mine owner will record and report key information regarding the incident, e.g., nature of incident, how it happened, what was done to rectify the harm (to people and the environment), how will activities be improved to avoid a recurrence, etc.



## Compliance checklist

**Maw and Concession number:**

**Name of mine and company:**

**Location and site map:**

**GPS coordinates:**

**Date of inspection/audit:**

Evidence of compliance	Complies? (Y or N)
Mine plan and surface water management.	
Mining activities in accordance with mine plan.	
Workers know what is required of them and are working according to the requirements of this management plan.	
Evidence of provision and use of safety equipment.	
Sediment traps and silt fences installed and functional.	
Chemicals and hazardous materials properly stored (fuel, oil, grease, chemicals, etc).	
Discharge water quality acceptable.	
No evidence of soil or water contamination.	
No evidence of waste being blown, washed or taken into the environment.	
Evidence of rehabilitation and revegetation.	

## 12 Review and revision of EMP

This EMP will be reviewed every five years to assess its effectiveness in managing the environmental and social impacts of ASM. The five-yearly review will include:

- Laws, rules, guidelines and standards to ensure they are still current and applicable. Revoked or superseded laws, rules, guidelines and standards will be deleted and any new laws, rules, guidelines and standards added.
- Mining methods to ensure they accurately describe the type of mining being done.
- Hazards and impacts to ensure all hazards and impacts are identified and assessed.
- Management measures and procedures to ensure they remain valid and effective in managing the environmental and social impacts.

It is important that document control is applied in revising the EMP. This is version 1 or revision 1 (Rev 1) of the EMP. Subsequent versions will be acknowledged by sequential numbers. For example, the next version or revision will be Rev 2. Subsequent revisions must include the date they come into force and will supersede all previous versions. Superseded revisions must be removed from all sites and replaced with the current revision.

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## **Appendix 1 Notifications**



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Appendix 1 contains a selection of notifications relevant to the preparation of this EMP. This is not an exhaustive list of all notifications that have been issued.

The notifications in Appendix 1 that have been incorporated into this EMP have been translated from Burmese to English by Valentis.

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The Republic of the Union of Myanmar

Ministry of Mines

Myanmar Gems Enterprise

Department of Jade Mining

Lone Khin

Letter No. Ka-37/ 078/2014

Date: September 4, 2015

To

Gem companies in joint venture with the government (all)

Private gem companies/associations (all)

Lone Khin/Hpakant Gems tract

Subject: Re preventing from environmental conservation damages due to jade mining in  
Lonekhin / Hpakant gems tract

1. As gemstone blocks are permitted for mining operation again by Scrutinizing and Management Committee as per notification no. 4/2014 in Lone Khin/Hpakant gems tract starting from 1.9.2014, gem companies/private companies/ associations in joint venture with the government who has obtained a permit for jade mining/production shall carry out the mining operations and throw away the mine waste systematically in order to prevent from environmental conservation damages.
2. The Ministry of Mines has issued a notification no. (121/99) on 4.10.1999 for the permit holders to follow. In Chapter (5) of such notification, regulations for permit holders to follow in order to prevent from environmental conservation damages caused by gemstone production are promulgated.
3. In addition, the Ministry of Mines also enacted The Amending Law of the Myanmar Gemstone Law as per Law No. (8/2013), enacted on 16.6.2003 which states that company/association with a permit (or) when operating a private gemstone production, combined area of mine waste dump shall be designated within a gemstone tract and if willing to dump the mine waste outside the block, permit shall be applied to the Ministry of Mines.

4. Nevertheless, mine waste, rocks, stones fall into Uru creek and brooklet that flows into Uru creek and the creek floor has been raised due to heavy sedimentation and floods happen.
5. Those who hold the permit for jade mining/production shall abide by the notification no. 121/99, chapter 5 as per 4.10.1999 issued by the Ministry of Mines and also follow the below precisely-
  - (a) Mine waste and rocks produced from jade mining by machines from inland blocks within gemstone tracts must not be thrown into gemstone tract, flash water canals that flows into the rivers/creeks and valleys.
  - (b) In the gems tract area, besides or into the rivers, or anywhere heavy sedimentation can happen, mine waste must not be discarded, if waste unavoidably shall be discarded into the creeks, flash water canals and valleys, Detention ponds shall be built in the place before the water flows into the creeks. Soil waste and rocks shall be collected in the detention ponds and removed from the creek, only the water shall flow into the creek.
  - (c) Rocks that have been in the creeks shall be removed and put on the bank of the creek through the management of Area Supervisor and respected companies. On the side of the creek, the rocks shall be piled up to a certain height and soil shall be placed. To have better retained creek bank, trees shall be grown.
  - (d) Redirecting the creek current in the gems tract area, building temporary dams, making ditch and undermined area shall not be done at all.
  - (e) Small rocks and mine waste which blocks rivers/creeks, let the rain water wash away in rainy reason and end of raining season, to have better current in the creeks, creeks drudging and clearing the blockage work shall be done.
  - (f) Soil waste must not be dumped in the not permitted area without permit.
  - (g) Gemstone mining, and dumping mine waste and rocks/stones must not be done in water catchment areas.
  - (h) For the gemstone production work, permit holders shall abide the notification dated (4.10.1999) notification number (121/99), the gems mined out area, ditch, pits and damaged caused by the mining operation, surface disturbances or for the dangerous area shall be done safe or replantation of trees shall be done.
6. Permit holders for gemstone production in Lone Khin/Phar Kant gemstone tract area fail to follow the above instructions may be charged in accordance with section (38) and section (43) of the Myanmar Gemstone Law.
7. Therefore, gem companies/private companies/ associations with a permit in joint venture with the government shall follow the above instructions closely with respect in order to prevent from environmental conservation damages caused by jade mining/production.

Shwe Lin Maung  
Director

Copy to

Minister, Ministry of Forestry and Mines, Kachin Government , Myitkyina Town  
Managing Director, Myanmar Gems Enterprise, Naypyitaw

Township administrator, Hpakhant General Administration Department, Hpakant Town  
Sub department, operation supervisors, Department of Jade Minings, Lonekhin  
Camp manager, Department of Jade Mining (Moenyin, Khamti)  
Office Copy/ Permit to send





**The Republic of the Union of Myanmar**  
**Ministry of Natural Resources and Environmental Conservation**  
**Myanmar Gems Enterprise**  
**Department of Jade Excavation**  
**Lone Khin**  
Fax: 074-72422  
Email: [jade.lonekhin@gmail.com](mailto:jade.lonekhin@gmail.com)

Letter No. Ka-37/ 146/2016

Date: January 26, 2016

To

Owner/Person in charge

.....Company

**Subject: To dump mine waste in combined mine waste areas systematically in Lone Khin, Hpakant Gems tract area**

1. Inspection and Management Committee held a (10/2015) inspection and management committee's meeting and decided to permit dumping of the waste from the Lonekhin Hpakant jade mining operation on (12) dumping areas previously designated places to dump mine waste from jade mining during dry season in order to protect from environmental damages in Lone Khin, HpaKant gemstone tract.
2. Therefore, mine waste produced from raw jade mining during dry season 2016-2017 in Lone Khin, HpaKant gemstone tract shall be dumped in (12) combined waste dumping site previously and allowed to dump again on it systematically.

No	Mine waste area	Designated acres of the area	Acres used for dumping	Newly added acres for dumping
(a)	Nant Mhaw	30	20	10
(b)	Nant Ham	30	10	20
(c)	Masa	90	40	50
(d)	Nant Ma Phit	80	50	30
(e)	Maung Maung Bwan	150	90	60
(f)	Ka Lar Mhaw	80	60	20
(g)	Sate Mu Ywar Haung	120	50	70

(h)	Sai Aung	150	50	100
(i)	Kan Khan Bwan	300	150	150
(j)	Ahtet Met Lin Chaung	150	60	90
(k)	Wai Khar	150	80	70
(l)	Yay Aye Chaung	150	50	100

3. Therefore, those with gemstone mining/production permits shall abide by the directives issued by the Ministry of Mines relating to dumping mine waste and also follow the below instructions precisely–
  - (a) Not to dump the mine waste and sandstone produced from mining within inland blocks in gemstone tract into river/creeks and tributaries located in gemstone tract.
  - (b) The waste shall not be dumped into or right and left banks of the Uru river (300) feet distance unless special instruction to raise the banks or to make the river flow better.
  - (c) Big stones/rocks gathered from dumping mine waste shall only be thrown away in designated areas to avoid bad current and blockage and to prevent from danger for the by passer.
  - (d) Places near the human habitats, creeks, it can be dangerous due to piling of soil waste and waste stockpile may slide down, it may also block the creek current, road and bridge, houses blockage, the danger of flood, and there could be possible environmental impacts, therefore, the Maws (jade mining areas) shall collectively manage the adverse danger and prevent from environmental damages with special care.
  - (e) Mine waste dumped in combined area shall be structured with benches that have enough space (45 degree slope).
  - (f) Caution signs such as “Danger - combined mine waste stockpile”, “No trespasses” signposts shall be set up.
  - (g) In respected companies combined dumping sites, watchers tents shall be built, safety and hazard prevention scheme should be monitored very carefully. Dumping should be allowed only if there is no further danger.
  - (h) If waste has to be dumped into the creeks, flash water canals, detention ponds should be built before flowing into the creeks, sedimentation and wastes shall be collected in the detention ponds and removed from it. Only water shall flow into the creeks.
  - (i) In the low creeks banks, raising the banks and removing the big boulder through the management of Area supervisors, companies owners shall do that. The sides and on the banks of the creeks, the banks shall be raised systematically until it has enough height. Repairing the banks, if the creeks are not blocked by the big boulders, the big stones to be discarded shall be arranged on the bank nicely, the soil shall be covered for the tree plantation.
  - (j) If raw jade is discovered, towers and water filtering tanks shall be built to allow sedimentation of deep mud and flowing of clear/clean water. Let it settle down and clear water only shall flow out.
  - (k) If sand and stones are blocked in Uru creek and tributaries due to mining operations, machinery shall be used to mitigate the relevant area collectively.
  - (l) Land filling of the surface damaged by ditch, pits and work after gemstone mining (or) other safe methods shall be used and trees shall be grown.

(m) Gemstone mining in catchment areas will not be allowed. To conserve the catchment areas.

4. Therefore, owners and persons in charge who carry out jade/gems mining in Lone Khin, HpaKant gemstone tract shall make sure all workers follow the law, rule, orders and instructions in order to avoid unnecessary lawsuit.

Tin San Aung

Director

Copy

Managing Director, Myanmar Gems Enterprise

Township Adminsitrator, Township General Administration Department, Hpakant Town

Chairman, Gems Entrepreneurs Association (Hpakant)

Survey and Inspection Department (sub), Department of Jade Mining, Lone Khin

Office Reciept and Permit to sent



The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation  
Myanmar Gems Enterprise  
Department of Jade Mining  
Lone Khin  
Fax: 074-72422  
Email: [jade.lonekhin@gmail.com](mailto:jade.lonekhin@gmail.com)

Letter No. Ka-37/ 209/2017

Date: February 16, 2016

To

Owner/Person in charge

..... Company/Association

Subject: Companies to follow the instruction relating to landslides caused by in Jade mining  
Operations in Lone Khin, Hpakhant Gems tract Area

Reference: Letter No. Nya-1/1-107/2016 of Myanmar Gems Enterprise issued on 8.2.2016

1. Natural resources in Jade and Gems concessions under the administration of Myanmar Gems Enterprise are being mined by way of surface and underground mining, and as it is gems tract area, the tailing stockpiles are contiguous to jade and gems concessions area. Sometimes, there are landslides on the normal mountain and stockpile landslide at work site and heavy machinery accidents. Due to rain water and the moisture, it causes soil instability, cracks and it can also cause potential dangerous landslide. We also have seen the environmental impacts, environmental pollution and other dangerous worksite hazard.
2. In the said jade concessions, the landslide at workplaces, tailing stockpiles landslide, environmental impacts, pollution, accidents of the vehicles used at the worksite and other occupational hazard, therefore to prevent from all of these, the companies shall abide with the following instruction -
  - (a) In each and every gem tract area with the open cut mine method, when removing topsoil, to retain the stockpile, the company shall use Bench system, each Bench Height shall not exceed more than (25 ft), to have proper safe slope "Angle of Repose" shall not exceed



more than 45 degree, and to pay more attention not to have environmental impacts and to have proper occupational health and safety, every mines shall follow their prescribed Mine Design when carrying out the mining operation. Tailing shall be discarded at the designated place as instructed with systematic step by step.

- (b) The haul road made on the slope of the mine pit in the Open Cut concession shall be maintained and checked from time to time to see erosion and landslide. During raining season, haul road shall be checked daily, potential landslide area due to rain water, land deformed caused by undermined area and safety sign post shall be put there to keep all the workers away from it.
- (c) Building for people shall not be allowed to be built near the dangerous soil stockpile and cliff. The combined soil stockpile area and the cliff, the soil instability near the cliff, any building or no one shall be allowed to live there. In the potential landslide area, houses shall not be built and people shall not be allowed to live there.
- (d) In the raining season, on the heavy down pour day, cracks may occur, when that happens the houses shall be moved immediately and to report to the in charge person nearby when cracks and sign of potential landslide is starting. The in charge person shall take action immediately.
- (e) Due to rain, water going into open cut mine area, drainage and sump shall be clear for pumping the water out of the mine area. To have good and strong water pump, spare water pumps shall be kept as well for standby manner. Special arrangement shall be done for the drainage breakage if the drainage is broken while pumping. If there is any water tank above the mine site, the dam around the water tank shall be made secured strictly. The soil that can be softened and melt shall be removed as quickly as possible.
- (f) When it is raining without stopping, there can be leakages and it can create cracks and soil instability, when that happens, the operation shall be stopped until the right soil stability is back. To inspect all the companies who are instructed to stop temporarily whether they follow the instruction or not. There is always drainage breakage and landslide happens, when the operation starts again, the safety shall be scrutinized thoroughly.
- (g) Where it is raining without stopping, after the rain and the sun comes, the landslide usually happens, during this time, operation shall be paused, it is more important to have safety than production, when the site is safety to operate again, operation shall start again.
- (h) Not only in your concession area, but also the concessions that are contiguous to yours, if there is any sign of landslide heard or seen shall be notified. To help by informing nearby Mining department.
- (i) For the soil stockpile, not to have steep slope, the waste dump shall be made with benches/terraces, to have enough density, water shall be poured, pressed by roller paver equipment regularly.
- (j) To check whether there is cracks / or not, to assign all the big companies, to have enough light at the soil stockpile at night, when there are cracks and landslide to happen any time, to inform the Yaymasay stone picker by blowing whistle, showing signals and danger signs, signpost shall be put visibly at the site.
- (k) If it is thought to be any danger of potential landslide, the operation shall be stopped at once. People and equipment shall be relocated to the safe place as quickly as possible. To remove any danger soil that can cause landslide.

- (l) The dangerous places along the road to waste dump area (junction, curve, folk road), vinyl that has sign saying "Danger, move about with care" shall be posted for the public. The size of the poster shall be length (8) feet and width (2) feet with enough visibility. Enough traffic supervisors and vehicles direction control in charge shall be assigned and watch over it daily.
  - (m) Injuries, death and loss (covered by soil) due to natural disaster and hazard at site, rescue and medication if needed company shall use excavator as soon as possible. To prevent from happening it again, necessary things shall be done.
  - (n) To assign the in charge person for the rescue work at the same time and successfully day and night, the accident shall also be informed to the above department at the same time.
  - (o) Mining laws, Myanmar Gemstones Law and including Myanmar Investment law, the labor laws and their rights shall be learned and abide closely.
3. In the gems tract, for the mining work and safety measure, to avoid from the possible hazard at mine site, Officer from the department, in charge person from respected Maw, town elders will have education workshop about health and safety matter and at the same we would like to urge to follow the above instruction closely.

Dr Ye Htay (16 / 2 / 2017)

Director

Copy to

Managing director – Myanmar Gems Enterprise – Naypyitaw,

Permit to distribute (copy)



The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation

Myanmar Gems Enterprise

Department of Jade Mining

Lone Khin

Letter No. Ka-37/ 295/2017

Date: December 29, 2014

To

Owner/Manager

..... Gems Company, Cooperative Association

Subject: with regard to the implementation of raw jade mining operations and environmental conservation work systematically and to report monthly

Reference: Letter No. Nya-1/1-1918/2014 of Myanmar Gems Enterprise (Head Office) issued on 8.2.2016

1. The Ministry of Mines has already issued a notification as per letter no.85/2014(Annexure-1) dated May 12,2014 for those who have permits for gemstone mining and production in order to prevent impacts on environmental. The following information is included in the notification –
  - (a) Soil / Rocks waste from the Gems tract area must not be dumped into streams, and in addition do not discard waste to the water catchment area in the valley and flash water passages.
  - (b) If unavoidably the waste has to be dumped into the flash water passage and valleys, Detention pond shall be put before letting it flow into the river. Detention pond shall be used to keep the sediment from waste soil and rock before flowing down into the streams.
  - (c) When raising the lower bank of the stream, the rocks that are blocking the current shall be cleared by the Area Supervisors and local authority management as priority. The removed rocks shall be piled on the bank and to make it stable, the topsoil shall be on top of the rocks and trees must be grown on it.
  - (d) Mining by changing the current of the stream/creek, by making makeshift dam on the stream, by making ditch and undermined area in the stream (or) other ways shall not be done on the stream.
  - (e) Rock and soil waste shall be dumped systematically on the designated combined dumping area.
  - (f) Rock and soil waste shall be dumped in the combined dumping site without the permit.
  - (g) In the concession of the gems production permitted area, gems mining in the water catchment area and discarding soil and rock waste in it shall not be allowed at all.

2. Above statements as per notification no. 85/2014 issued by the Ministry of Mines shall be followed precisely by those who have a permit for gemstone production and those who fail to follow shall be taken action against in accordance with section 43 of Myanmar Gemstone Law which may result in 3-year prison sentence or fines or both and may also result in one of the following -
  - (a) Suspension of the operation in accordance with permit
  - (b) Allowing to continue the work after paying fine.
  - (c) Annulling the permit
  - (d) Informing the relevant Ministry to blacklist the company or association, director of that company or association
3. Therefore, those who hold the gemstone production permits shall carry out the following with integrity, awareness and caution as a good citizen.
  - (a) Those who carry out gemstone mining in respective gems areas shall undertake methodically to conserve natural environments from damages.
  - (b) To draw up plan to conserve the environment not to have impacts on the environment.
  - (c) In the prepared plan, either by one concession, concessions, one maw by one maw, soil waste dump area, detention ponds, to discard systematically into sedimentary ponds, usage of it, scrutinizing it, waste dump area, detention ponds, dumped waste in sedimentary ponds, canals, it shall be managed directly or indirectly not to let sediments flow into streams.
  - (d) Canal and sediments due to sluicing and washing of gravel beds and that flows into streams and streamlets, and it shall be managed not let these flow into them.
  - (e) Rivers and river lets in the gems area, to have better current, the maintenance, removing the rocks in the rivers, silt, sediments shall also be removed.
  - (f) Waste dumping sites, gems mining in Maws, water catchment areas and other places, things shall be managed to carry out to prevent from erosion, topsoil damage, and less impact on the environment.
4. As Myanmar has become a 45<sup>th</sup> member of Extractive Industries Transparency Initiative (ETTI), The Global Transparency Standard will only be obtained if jade mining operations in Gems tract area shall be carried out methodically and conservation work is done systematically on a monthly basis.
5. Therefore, companies/cooperative associations shall carry out jade mining/production operations methodically and conservation of natural environment systematically as per notifications/ regulations announced precisely. The instructions, regulations shall be followed without fail. Natural environment conservation work for damages caused by jade exploration/mining shall be done monthly and status of such work shall be reported to upper departments along with maps, pictures before the 25<sup>th</sup> day of a month every month.

Copy to

Managing Director, Myanmar Gems Enterprise

Camp in Charge (Camp office (Khamti/Moenyin) to inform the business and supervise strictly

Office Receipt / Permit to send

Shwe Lin Maung

Director





The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation  
Myanmar Gems Enterprise  
Department of Jade Mining  
Lone Khin  
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Letter No. Ka-37/ 568/2015

Date: August 19, 2016

To

Owner/Manager/Person in charge

..... Company/association joint venture with the government  
Lonekhin/Hpakant Gems Tract

**Subject:** Regarding regulations to keep and look after the jade on the joint venture concessions for companies who are in joint venture with the government operating jade mining with production sharing and jade sales.

1. In Lonekhin/Hpakant gems tract, if company/association who want to jade mining and production may apply for the desired concession area in accordance with procedures set and after obtaining the state permit with the approval of Myanmar Gemstone Enterprises Development Committee shall proceed with the signing of the contract. In accordance with the agreement, designated area is measured on the ground and given to respected companies.
2. For the JV companies, the companies the temporary area is not assigned, companies temporary area is assigned and companies who have been given assigned area, the following instruction shall be followed:
  - (a) After the block is accepted, as per clauses in contract signed between Myanmar Gems Enterprise and companies, the letter with intended operation date requesting for permit for jade operation and production shall be sent to and obtained from Department of Jade Mining (Lone Khin).
  - (b) When the concession is given, demarcation mark with concrete post (or) iron pole (or) 4 inches square thick wooden post with white and red stripe and placed permanently. It is important to keep those demarcation posts and prevent from unwilling people removing it. If needs to be moved, it cannot be done by discretion of the concession's owner. If it is found that the demarcation mark is moved illegally, the company and its in charges shall be litigated by Myanmar Gemstone law.

- (c) If due to the operation needs, unwilling person, the demarcation mark needs to be replaced, it shall be reported to Department of Jade Mining (Lonekhine). It will be field surveyed and measured by the group.
  - (d) After the concession is given to the company, for the administrative building, the permitted company can level the ground for building area, and construct the building. If the company is given only temporary permit, when constructing the administrative buildings, if the raw jade is found, they shall be given to Department of Jade Mining (Lonekhin) office. Permanent buildings are not allowed on the site.
  - (e) For all the JV company, all the raw jades shall be sent to Department of Jade Mining (Lonekhin) office compound and Valuation, Cutting, Polishing, Pairing for exhibition, Packing, and Storing shall be done in the Jade Mining Department compound. The company assist in preparing of land and building of storage houses and installation of cutting machine in the Department of Jade Mining office compound.
  - (f) For the JV company, to do jade mining and production, if the agreement is signed between Myanmar Gems Enterprise and the company, it will be necessary to recruit workers, arrange vehicles, heavy machinery, rations, fuel, industrial gun powder (ammonium nitrate) quickly in order to start the jade mining operation. To add more vehicles and equipment shall be done in accordance with the instruction. The preparation and progress report shall be sent to Department of Jade Mining (Lonekhin).
  - (g) For the jade mining and production, the (4) types of "Work Program" shall be sent to Managing Director of Myanmar Gems Enterprise and a copy shall be sent to Department of Jade Mining (Lonekhin).
  - (h) When there is any trespasses in your JV concession area, illegal miners, and no waste dump shall be allowed. For the company itself, without the permit, jade mining cannot be done and waste from private company shall not be dumped.
  - (i) Not related person, tents shall not be allowed in the concession area.
  - (j) The company shall take full responsibility for the JV concession area and as well as JV Jade mining and production operation shall be done in accordance with procedures, notifications, Myanmar Gemstone Law and Rules by paying special attention. They shall learn them and abide seriously.
  - (k) Especially, in the JV concession area, making drugs, storing drugs, distribution of drugs and keeping illegal arms and illegal matter shall not allowed at all.
3. Therefore, the JV companies with the state are allowed with the trust for the Jade Mining and Production, the company and its related people take full responsibility step by step to protect company and its related people's dignity. We would like to inform the above.

Copy to

Managing Director, Myanmar Gems Enterprise  
 Assistant Director (Jade), Myanmar Gems Enterprise  
 Supervisors (Sub-department), Jade Mining Department, Lonekhin  
 Department of Survey and Field team, Jade Mining Department, Lonekhin  
 Area Supervisor Members (area – 1,2,3,4,5,6,7,8,9,10  
 Onsite Supervisor

.....company, .....maw, concession ( ), Office receipt  
 and permit to send

Shwe Lin Maung

Director General

Tin San Aung

Director General



The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation  
Myanmar Gems Enterprise  
Department of Jade Mining  
Lone Khin  
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Letter No. Ka-37/ 578/2016

Date: August 22, 2016

To

Owner/Person in charge

..... Company/Association

Subject: Companies to designate Geologists and Mining Experts relevant to the workplace

Reference: Letter No. Ka-37/639/2015 of Department of Jade Excavation (Lone Khin) issued on  
10.12.2015

1. Consortium, private company, associations shall hire experts for the management of mining methods which could not possibly damage the natural environment and social surroundings and for the right method of mining when excavating within Lone Khin, Hpakant gems tract.
2. However, consortium, private company, associations only submitted a list of supervisor, security personnel and vehicle/equipment in charge currently working.
3. As companies are required to designate experts such as Geologists and Mining Experts when carrying out jade mining operations. Companies/associations who have not designated such experts shall proceed with the hiring process and when finished, please report back to the department.

Tin San Aung

Director General

Copy to

Managing Director, Myanmar Gems Enterprise, Naypyitaw

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The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation  
Myanmar Gems Enterprise  
Department of Jade Mining  
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Letter No. Ka-37/ 581/2016

Date: August 22, 2016

To

Managing Director/Person in charge

..... Company/Association

Subject: **Rules/Regulations for company/association to follow when designating staff/laborers**

Reference: Letter No. Ka-37/141/2016 of Department of Jade Excavation (Lone Khin) issued on 26.1.2016

1. Management of companies/associations who carry out jade mining shall abide by the following instructions when hiring staff/laborers –
  - (a) All staff must not wear military green uniform, and green camouflage uniform.
  - (b) To provide suitable uniform for mineral mining, mining helmet, safety shoes, gloves, face mask and earmuffs to be worn in workplaces as required by work environment.
  - (c) All staff and laborers must not use, sell, buy, and store drugs.
  - (d) To register all company's staff into social security board and company shall maintain the list of staff who completed the registration.
  - (e) To allow workers to only work in accordance with schedules set for over ground/underground.
  - (f) To allow working holidays as announced by the government.
  - (g) To designate minimum wage as 450 kyats per 1 hour and 3,600 kyats for 8 working hours per day as determined for the whole country regardless of regional difference and work type difference.
  - (h) To provide overtime fees in accordance with relevant laws if the nature of work demands overtime.

- (i) To continue paying the labor same amount of minimum wage if the amount exceeds the amount published in Minimum Wage Law, 2013 under section (14) (b).
  - (j) To increase the minimum wage to a minimum wage determined in accordance with relevant law if the current amount of minimum wage is lower than the amount determined.
  - (k) To pay the same amount of minimum wage determined regardless of gender difference and to pay the same amount of minimum wage per hour as determined for labors who work hourly.
  - (l) To train the staff/labor in order to reach a determined professionalism (or) production standards if necessary before the probation period and to pay 50% of determined minimum wage during 3 months of training period and 75% of determined minimum wage during 3 months of probation period.
  - (m) As per section 44(a) of Minimum Wage Rules, labors shall fulfil the designated production capabilities in accordance with the level of professionalism they have.
  - (n) As the minimum wage and overtime fees are a requirement stated by the law, other form of compensation such as bonuses shall be awarded depending on the success of work and profits gained.
  - (o) To avoid conflicts with leave and holidays designated for labors who are on a minimum wage.
  - (p) Minimum wage for small businesses with less than (15) labors, businesses irrelevant to family owned businesses shall be negotiated and agreed between owner and labor.
  - (q) Staff/labor shall sign a employment agreement relating employment confirmation within 30 days after they have been hired.
  - (r) Employment agreement and pay slip forms issued by relevant labor township office when paying salaries.
  - (s) To keep and maintain the personal records of staff/labor who are currently undertaking responsibilities in jade excavation areas.
  - (t) When hiring company's staff/labor, employment agreement shall be signed in accordance with law, rules and directives.
  - (u) To hire a person in charge assigned by the owner for the management of operations in every gemstone block, manager with required qualification and abilities and experts for excavation.
  - (v) To submit a right list of staff/labor to Department of Jade Mining (Lone Khin)
2. Therefore, I would like to notify all business owners who have raw jade Mining operations in Lone Khin, Phar Khant Yadanar area to carry out in accordance with directives stated as per above paragraph (1) when hiring laborers.

Tin San Aung

Director General

Copies to

Managing Director, Myanmar Gems Enterprise

Camp in charge, Department of Jade Mining (Khan Htee/ Moe Nyin) – To also inform Companies

Myanmar Gems and Jewellery Entrepreneurs Association (Hpakant)

Office Reciept / Permit to Send



The Republic of the Union of Myanmar  
Ministry of Natural Resources and Environmental Conservation  
Myanmar Gems Enterprise  
Department of Jade Mining  
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Letter No. Ka-37/ 656/2015

Date: December 15, 2015

To

Owner/Manager/Person in charge

..... Company/association joint venture with the government  
Lonekhin/Hpakant Gems Tract

**Subject:** Regarding regulations to keep and look after the jade on the joint venture concessions for companies who are in joint venture with the government operating jade mining with production sharing and jade sales.

1. In Lonekhin/Hpakant gems tract, if company/association who want to jade mining and production may apply for the desired concession area in accordance with procedures set and after obtaining the state permit with the approval of Myanmar Gemstone Enterprises Development Committee shall proceed with the signing of the contract. In accordance with the agreement, designated area is measured on the ground and given to respected companies.
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  - (b) When the concession is given, demarcation mark with concrete post (or) iron pole (or) 4 inches square thick wooden post with white and red stripe and placed permanently. It is important to keep those demarcation posts and prevent from unwilling people removing it. If needs to be moved, it cannot be done by discretion of the concession's owner. If it is

- found that the demarcation mark is moved illegally, the company and its in charges shall be litigated by Myanmar Gemstone law.
- (c) If due to the operation needs, unwilling person, the demarcation mark needs to be replaced, it shall be reported to Department of Jade Mining (Lonekhine). It will be field surveyed and measured by the group.
  - (d) After the concession is given to the company, for the administrative building, the permitted company can level the ground for building area, and construct the building. If the company is given only temporary permit, when constructing the administrative buildings, if the raw jade is found, they shall be given to Department of Jade Mining (Lonekhin) office. Permanent buildings are not allowed on the site.
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3. Therefore, the JV companies with the state are allowed with the trust for the Jade Mining and Production, the company and its related people take full responsibility step by step to protect company and its related people's dignity. We would like to inform the above.

Copy to

Managing Director, Myanmar Gems Enterprise  
Assistant Director (Jade), Myanmar Gems Enterprise  
Supervisors (Sub-department), Jade Mining Department, Lonekhin  
Department of Survey and Field team, Jade Mining Department, Lonekhin  
Area Supervisor Members (area – 1,2,3,4,5,6,7,8,9,10  
Onsite Supervisor

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and permit to send

Shwe Lin Maung

Director General





The Republic of the Union of Myanmar

Ministry of Natural Resources and N

Myanmar Gems Enterprise

Department of Jade Mining

Lone Khin

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E-mail: jade.lonekhin@gmail.com

Letter No. Ka-37/ 383/2016

Date: May 23, 2016

To

Gem companies in joint venture with the government(all)

Private gem companies/associations(all)

Lone Khin/Phar Kant gemstone tract

Subject: Re supervision of Jade mining operation and occupational safety during raining season  
in Lonekhin/ Hpakant gems tract.

1. The permit holder of all the JV companies with the state/Private Companies/associations for jade mining and the permitted concessions have some landslides near the residence area in the raining season, therefore, necessary prevention shall be done in the worksite area.
2. Especially, during and towards end of raining season, due to non-stop rain, high temperature, intermittent rain, landslide on the natural land, softening of the soil, and cracks occur and worksite soil instability and landslides, building being damaged by those landslides, vehicles/heavy equipment, staffs / workers got injuries and unwanted events, occupational hazard.
3. When the permit holders of jade mining companies do operation, prevention for the following occupational health and safety and shall abide the instructions.
  - (a) During raining season, when there is a lot of rain, they should attention to safety more than occupational hazard.
  - (b) When it rains non-stop, the operation shall hold and when the operations commences again, occupational health and safety should be checked, mining shall resumes.

- (c) When removing the topsoil, to have stable wall, bench shall be made, the height of the bench shall be not more than 25 feet and to have safety, Angle of Repose, the slope shall not exceed more than 45 degree.
- (d) Building houses near the dangerous cliff shall not be allowed, the houses built at the base of the cliff and on the slope of the cliff, people should not be allowed to live there and to avoid building houses on the instable land.
- (e) During heavy rain, cracks may occur; the houses on the cracks shall be relocated as soon as possible. It shall be reported to the in charge person, the in charge person shall inspect it right away and action shall be taken immediately.
- (f) If there is the sign of danger of landslide, the operation shall stop, workers and vehicles shall be removed from the danger zones, the dangerous soil shall be removed.
- (g) When removing those soil, if the topsoil, it shall be removed until the soil is stable enough, making base retaining wall, if it is hard base, it cannot positioned 90 degree, but it shall be piled up only up to 30 degree.
- (h) In the open pit, depending on the strength of the stability, the suitable height of the wall shall be piled up, if the depth goes down more, the safe retaining wall shall go down as well and make suitable safe situation.
- (i) The haul road and the stability of the road shall be inspected strictly; the haul road along the side to prevent from landslide, special attention and care should be given.
- (j) Rain water canals during raining season can cause some landslide, safety signposts for the workers shall be put up visibly.
- (k) When there is heavy rain, and sun comes out, the landslide happens; operation shall be stopped during that period.
- (l) When there is heavy rain, the rain water canals breaks halfway, precautions shall be taken as quick as possible.
- (m) If there is any water tank for household use above the concession, inspection must be done to prevent from leakages, if the dam is melted, it shall be removed quickly.
- (n) Old mined out pit, old mine pit turned to lake, dumping site and lakes nearby the residence or villages which are dangerously located shall pay special attention, and to prevent from overflow, or broken dam, the water amount shall be reduced through the release drainage.
- (o) This is related to everyone, not only in your concession but also nearby concession contiguous, the landslides prone area is heard or seen, it shall be notified to respected mining department and assist in recovering that with the company own discretion.
- (p) Creek or stream that flows across the concession, the current shall be made good and in the temporary bridge built in summer time and soil dam, they all shall be dismantled and removed.
- (q) During raining season, in the jade mining operating concession, generators, switches and electricity lines shall be carefully installed to prevent from the danger of electricity.
- (r) In the gun powder (ammonium nitrate) storage houses, to do checking of lightning conductor or if it is not installed, lightning conductor shall be installed.
- (s) When blasting in the concession, overuse of explosives shall be avoided.
- (t) Miners shall be given miner's helmet, boots and gloves. It is the responsibility of the company.

- (u) Precaution and preparation shall be done for natural disaster in order to prevent loss of lives.
  - (v) For safety notification issued occasionally shall be flowed exactly.
  - (w) Site manager and mine in charge shall remind all the workers at the site for occupational health and safety all the time and rules/disciplines shall be issued to follow safety procedures.
  - (x) If there is any accident, it shall be reported immediately, it shall be reported in the format designated.
4. If it is found that the operation is not done in accordance with the occupational health and safety measure, the concession permit will be suspended temporarily, it shall be allowed again after the all the safety measures are fixed again.
  5. Therefore, Lonekhin Hpakant gems tract, the permit holder of jade mining companies JV with the state, Private company/ association will do the operation in raining season, to prevent the danger of landslide, hazards at worksites, accidents of the workers, injuries, and death, the owner/operation manager/ manager shall follow the above instruction as guidelines with care and instruct to all the workers of all levels.

Tin San Aung

Director

Copy to

Managing Director, Myanmar Gems Enterprise, Naypyitaw

Assistant Director (Jade), Myanmar Gems Enterprise, Naypyitaw

Camp in Charge, Department of Jade Mining (Moenyin/Khamti) –(to instruct to all the companies)

Office receipt/permit to send



The Government of the Union of Myanmar  
Ministry of Mines  
Minister Office

**Notification letter No 85 / 2004**

Yangon City, 1366 , 9 days after full moon day of Kasone  
(2004, May 12)

The Ministry of Mines according to the decision made during the Management Committee meeting (13-14/2004) held at the ministry of Mines on May 4, 2004 issued this notification in accordance with the mandate conferred under Myanmar Gems Law – law 54, sub (b).

**The Directives to be followed by the permit holder of gems production license not to have impacts on environmental conservation during operation of the gems production**

1. The Ministry of Mines has issued notification 121/99 dated 4 October 1999 to be followed by the permit holder of gems production license. In the **chapter (5)** of notification, the instructions to prevent from the impacts on environmental conservation due to gems production have been prescribed.
2. Moreover, in the amending law of Myanmar gems law (law no 8/2003) enacted on 16.6.2003, it is promulgated that the ministry of Mines has the right to designate the combined waste dump area for the permitted company, association or person who are doing gems production and if the permit holders may apply for a permit to designate an area in their concession or outside of it for sluicing, disaggregating the rocks and / or soil waste dump area from the ministry of Mines.
3. Nowadays, some of the gems production permit holders in Lonekhin, Hpakant and along Uru river did not comply with the restriction and there is constant impact on the environment. Especially, soil and rocks are thrown into Uru river and flash water rivers that flow into Uru river, valleys, because of that sandbank formation in Uru river, rising of river bed and current change happened and continuously it impacts Chindwin river.
4. Therefore, the gems tract designated area in Lonekhin, Hpakant gems tract and along Uru river, protection measure for environmental conservation impacts needs to be done.
5. Thus, the permit holders of gems productions shall followings exactly –
  - (a) Soil waste and rocks shall not be thrown into rivers in the gems tract area at all. Moreover, generally the waste shall not be thrown into the flash rivers that flow into the rivers and the valleys at all.
  - (b) If it inevitably has to throw into the rivers, flash water rivers and valleys, detention ponds shall be built before throwing it into the rivers. In this way, soil waste and rocks will be collected in the detention ponds and only water may flow into the rivers.

- (c) The lower bank of the river, when raising the bank of the river, big boulders blocking the rivers shall be removed through the management of Area supervisor groups and respected local authority. On the priority bank to be raised, boulders shall be arranged, on the arranged boulders, soil shall be filled. To have stable soil, trees shall be grown.
  - (d) In the rivers, excavating by redirecting current, by building temporary dam (temporary blockage), making pits and well (excavating in the river that appears to be pit or well) or other method of excavation shall not be done at all.
  - (e) Soil waste and rocks shall be discarded systematically in the designated combined dumping site.
  - (f) Soil waste and rocks shall not be discarded in not designated dumping area without permit at all.
  - (g) Water catchment area in the gems production permitted concession, gems mining, soil and rock waste must not be discarded at all.
6. The person who fail to comply with this notification clause (5), according to Myanmar gemstones law – law 43, up to 3 years jail, fine or both maybe applied. Besides, according to Myanmar gemstones law – law 38, either one of following administrative notifications shall be applied –
- (a) Suspension of the operation according to permit or license
  - (b) Permitting the operation after fine is paid
  - (c) Cancellation of permit or the license
  - (d) Notifying the respected department to blacklist the director or anyone from the company or association or the company and association itself.

General Ohn Myint  
Minister  
Ministry of Mines

Letter No< 14 – sub group (2) 2004 (environment)

Date: 2004, May 12

**Distribution**

- The chairman office of State Peace and Development Council
- The office of State Peace and Development Council
- Union Minister office
- The office of Government of the Union of Myanmar
- Environmental Conservation Committee
- High Court



- The office of Attorney General
- The office of the Auditor General
- Ministry of Mines, Environmental Conservation Committee
- All the ministries
- Director General, Department of Mines
- All the enterprises and the rest of the departments in the Ministry of Mines
- Managing Director, Press and publishing Enterprise, Myanmar Publishing house, request to include in the announcement.



The Government of the Union of Myanmar  
Ministry of Mines  
(Minister's office)  
Yangon City, 1362 (ME), (10) days after fullmoon day of Tawthalin  
(1999, October 4)

**Notification letter No 121/99**

The Ministry of Mine issued this notification, regarding the matters in the Myanmar Gems Law, Law 16, sub law (f), sub sections (1) to (7), in order for gems production permit holders to abide with the instructions, in accordance with the mandate conferred under the Myanmar Gems law – Law 54, sub law (b).

The directives to be followed by Permit holders of Gems Production

**Chapter (1)**

**Designation of the standard for employing staff and workers, workload, age, wage, salary and other remuneration in the Gems production work**

1. In every gems concession, a manager qualified with the specified management and supervisory skills in order to run the operation at the site shall be employed. The decision and action of that manager shall be deemed to the instruction of the permit holder. Gems production permit holder if he himself is qualified to operate the site, he may work as manager.
2. Children under the designated must not be employed.
3. Except health care and social care staffs, women must not be employed underground camps of the gems concession.
4. Health certificate which shows fitness for work and confirmation of age (18) completion shall be requested from and issued by the Department of Health. Only those health certificate and confirmation of age (18) completion recognition holders can be employed, under age employees shall not be employed in the gems tract concession.
5. (a) If between chief inspector or inspection in charge and gems tract concession manager that a person without birth certificate or any dispute whether that person is age (18) completed or not, is found, the decision must be sought from the doctor of the respected Department of Health.  
(b) The decision of the doctor of the Department of Health on whether a person is 18 or not shall be final according to the power this notification.
6. (a) In the gems concessions, for all the employees, the registration books shall be kept as in the annexure form (1).

- (b) In the gems concessions, for the workers assigned for underground work, the registration books shall be kept as well as in the annexure form (2). During operation times, the worker's name shall be writing in the book without fail.
7. The permit holder of the Gems Tract production or the manager of the gems concession shall do the following for a worker employed at the site.
- (a) If the worker is asked to work more than designated hours, he/she shall be paid double wage and if the worker receives other provision or support, he/she shall be paid as usual.
- (b) If the worker has to work on the public holidays, for the days he works, the normal salary or other remunerations specified by the Ministry of Labor shall be paid.
8. If the workers are paid by quantity, the permit holder or the manager according to this notification, these workers shall be paid with the rate that is average wage to other workers as closed as possible. The rate specification shall be regarded as normal rate according to this notification.

## **Chapter (2)**

### **Designation of workings days and hours for under and upper ground in the Gems Production work**

9. The permit holder or manager of the gems tract production shall –
- (a) Nobody in the gems concession shall be asked to work more than (5) days in a week.
- (b) A worker employed at the Gems concession shall not be asked to work for (8) hours per day, more than (40) hours per week or shall not be allowed to work. However, according to the needs of the work, if a worker has to work for the whole day, (48) hours in a week can be allowed.
- (c) The working hour of a person working in on surface of the ground of the Gems Tract concession, including break time shall be arranged not exceeding (10) hours. If there is no (1) hour break, worker shall not be asked to work more than (5) hours.
- (d) One type of work underground in Gems Tract concession shall not exceed more than (8) hours. However, based on the need of the work, shifts can be arranged. When practicing shifts, it shall not be assigned more than (8) per shift.
- (e) No person assigned in the Gems tract concession shall not be in the underground mine except the designated time mentioned in the record sheet.
- (f) When practicing shift system, if a worker is asked to work beyond midnight, the calculation of hours for the shift shall be based on (24 hours), the hours of work shall be counted starting from when designated shift hours ends. The working hours shall be added to the previous working day.
- (g) In front of the Gems Tract concession office, as per annexure forms (3) and (4), the start and end of workings hours of upper and underground of Gems Tract concession, and if shift system is intended to use, shifts time of each shift shall be put on the notice board. A copy of working hours and shift notice shall be sent to Chief Inspector.

- (h) Referring to the above sub section (g), the notice shall be posted (7) before commencing the operation.
  - (i) In the Gems Tract Concession, if the start and end of working time is generally intended to change, changing the shift time, before doing that not less than (7) days, the amendment shall be posted outside of Gems Tract concession office in accordance with Gems Laws :- Annexure form (5). (7) days before amending the time, a copy of notice shall be sent to Chief Inspector.
  - (j) Without sending any notice in accordance with the sub section (g), no workers shall be allowed to work in the Gems Tract concession.
  - (k) If there is no off day (3) working days before and after Saturday and Sunday, the workers in a gems tract concession shall not work either on Saturday or Sunday.
  - (l) Replacement off as prescribed in the sub clause (o) cannot be allowed, the leave entitled worker shall get back the off days in lieu within one month. The number of off days shall be as the same number of days he worked as replacement.
  - (m) Before Saturday, Sunday or replacement off day (either earlier day), the notification letter of replacement of in a gems tract concession shall be posted for at least 24 hours before the start and end of working time in gems tract concession for that replacement of off:- Saturday, Sunday or the replacement off day. The workers shall not be asked to work for 10 days continuously without giving (2) rest days.
  - (n) The notice letter posted in a gems tract concession area can be cancelled one day before Saturday, Sunday or the replacement off day.
  - (o) When calculating the working hours of off day if a worker has to work on either on Saturday or Sunday, Saturday or Sunday that the worker works shall be calculated and included in the week that worker is entitled for replacement off day.
10. No matter how it is described in the above clause (9), if there is any emergency situation due to danger to the workers, Gems Production permit holders or the manager may alter working time against the restriction given in the above clause (9). When inspection comes to Gems tract concession site, to be able to present the facts, it shall be recorded immediately and as well as a copy shall be sent to Chief inspector as soon as possible.

**Chapter (3)**  
**Planning for prevention of accidents and safety**  
**at the Gems production worksite**

11. The permit holder of gems production license or the manager shall have necessary planning for safety and prevention for accidents as needed for the gems concessions under his supervision. Especially, the followings shall be arranged and planned.

- (a) When carrying out the gems production activities, the Occupation Health and safety at the site, there must be design and plan for electricity, machinery management and including communication system and other necessary materials.
  - (b) When commencing the Gems Tract concession, operation, maintenance and suspension of work, there must be planning for the safety of workers and other persons without having health impacts and carry out their assigned task safely
  - (c) Maintenance of the stability of the haul road going into the worksite shall be done.
  - (d) In every underground mine, if possible, there must be two emergency exits that can be accessible out to the surface.
  - (e) Regular inspection shall be done whether there is possible danger for the workers at the worksite or not.
  - (f) It must be arranged to have enough oxygen in the permitted underground sites.
  - (g) In the worksite where there can be any unusual danger, to have safety for the workers, Procedure and Planning shall be prepared and posted near that area.
  - (h) To prevent from breaking of fire, spreading and explosion dangers, the pre-planning and procedure that is suitable for gems production worksite must be prepared and necessary things must be arranged in order to know the danger in advance and settle it in time.
  - (i) For health and safety, when it is a critical situation, the work must be stopped and workers shall be relocated to a safe place.
12. The permit holder of Gems Production license or the manager shall plan prevention measures for predictable natural and worksite dangers based on the characteristic of each gems concession.
13. With regard to body, chemical or dangers to biodiversity, if there can be any danger at worksite, the permit holder of Gems Production license or the manager shall –
- (a) All the workers shall be briefed with occupational health and safety in advance.
  - (b) When meeting with dangers, suitable planning shall be prepared for reduction of injury or complete remediation.
  - (c) If the dangers or health damage cannot be recovered by other ways efficiently, workers shall wear complete safety costumes, safety equipment and other safety measures free of charge.
  - (d) For the injured workers, to have proper medical treatment, they shall be sent to the treatment area as quick as possible.
  - (e) For the injured workers, free medical cares shall be arranged.
14. The permit holder of gems production license or the manager shall -
- (a) In addition to occupational health and safety of the workers, safety related to worksite and easy to understand notices shall be issued occasionally, sufficient training and occasional drilling and retraining shall be arranged.
  - (b) In order to have safe operation of the Gems Tract concession in accordance with the laws, enough number of in charge person for the shifts.

- (c) System to know number workers shall be prepared to know who are in the underground at all times.
- (d) If there is any accident, the event of accident shall be inspected; necessary precaution and repair shall be done and reported to the respected in charge person in accordance with laws.
- (e) To prevent from worksite health safety in the gems tract concession for all the workers, regular inspection system shall be used.

15. The permit holder of gems production license or the manager shall –

- (a) Brining ammonium nitrate and related materials to houses, keeping in the houses, to store them in the ammonium nitrate store houses, the place selected and permitted by ministry of Defense.
- (b) Ammonium nitrate and related materials shall be handled by the qualified person assigned by letter, that person name shall be registered in the specified record book in accordance with the law.
- (c) Detonators shall be kept in the chest locked. It shall not be kept together either with ammonium nitrate or other related materials. No detonators shall be kept in the ammonium if it is not to be used at once.
- (d) For all the blasting, the person who is qualified not under the age of (18) assigned by the manager or foreman shall carry out the procedures in accordance with further instruction. Their names shall be recorded in the record book.
- (e) With regard to ammonium nitrate and related materials, how many blast, how much is being used and how many which did not explode shall be recorded in the daily records book.
- (f) The excess ammonium nitrate and related materials shall be returned to the store houses without delay.
- (g) When allowing a person to carry ammonium nitrate and related materials to the underground mines, the chest, bucket or hand carry bag that can only carry 2.5 kg shall be allowed.
- (h) When carrying ammonium nitrate and related materials, it shall be put in the designated chest, bucket or hand carry bag and carried firmly and safely.
- (i) When inserting the ammonium nitrate into the hole, iron or steel shall not be allowed to use. Besides, no ammonium nitrate and related materials shall be pounded when inserting.
- (j) When blasting underground, before doing anything nearby people shall be notified and all the entrances that people can access to the blasting areas, people shall guard at the entrances.
- (k) When two underground mines, one is (3) meters far from the other, if people have not left or if there is no wall, the other place cannot blast at that place.
- (l) In the open cut mine, before doing the blasting, or after the blasting, good and systematic way warning shall be announced.
- (m) When blasting ammonium nitrate and related materials, at least two people shall count numbers of explosions. The least number of explosions counted shall be taken. Explosion is



- not observed to be exploded, within 30 mins nobody shall go into that place. If the explosion was done through electricity, nobody shall go into that place within 20 mins.
- (n) In the underground mine area, after the blasting is done, nobody shall be allowed to access to that place before blasting in charge who is qualified assigned by the Gems Concession manager through letter shall go and check the place. Assistant blasting in charge shall also make sure the place is safe. Only after thorough inspection and safety announcement is issued, people will be allowed to go in.
  - (o) In the ammonium nitrate hole, when ammonium nitrate and related materials is inserted, it shall not be attempted to remove again.
  - (p) Into the blasted old hole, it shall not be attempted to blast again.
  - (q) If it does not explode, ammonium nitrate and related materials, it shall be destroyed with air or water. Or if explosion does not happen, at least 0.3 meter distance, another hole shall be dug for another blasting. In this way, unexploded ammonium nitrate can be exploded and destroyed.
  - (r) Before destroying the unexploded blast hole, another hole with the distance of 0.3 meter shall not be dug. When digging another hole with the distance of 0.3 meter, but safety shall pay special attention when digging the hole. When digging the hole and inserting ammonium nitrate and related materials shall be accompanied by blasting in charge person.
  - (s) The unexploded blasting hole before completion of the clearance, it shall be left it as it is, there must be a person who warns everyone nearby or that place shall be fenced. If it is open cut mining, red flag shall be put up.

#### **Chapter (4)**

#### **Management and Implementation of the disciplines, cleaning, health, staff and workers shop at the Gems production site**

- 16. The permit holder of gems production license or the manager, before carrying out the gem production operation, staff, workers waived shops, healthcare, cleaning and disciplines plan shall be prepared and presented to Ministry of Mines.
- 17. The Ministry of Mines shall amend, add and confirm the planning proposed by the permit holder of gems production license or the manager as per the above clause (16).
- 18. The permit holder of gems production license or the manager shall implement the planning proposal approved the department for the staff and work waived shops, healthcare, cleaning and disciplines plan.

#### **Chapter (5)**

#### **Planning for the environmental conservation work not to have impacts due to Gems Production work**

19. The permit holder of gems production license shall –
- (a) The surfaces disturbances caused by the drill holes, pit, underground pit, back filling or to prevent from the dangers, through other ways mitigation must be done until the Ministry of Mines or the department of mines is satisfied.
  - (b) Within the forest land and forest covered land that can be managed by the government, the gems production work is done. If the trees were cut down, reforestation or compensation agreed with the Ministry of Forestry when it was negotiated.
20. The permit holder of the gems production license or the manager when discarding tailing, waste water, waste soil and gas emitted into the water, air and soil pollution and to have living animal safe, these shall be tested at the laboratory. When testing at the lab, if the poisonous and dangerous chemicals are found, it shall be neutralized by chemical way and when proved that it is safe to throw, waste can be discarded systematically.

## **Chapter (6)**

### **Reporting the accidents**

21. (a) Inside the gems tract concession or near the gems tract concession area, if there is any death case due to accident or severe injury to the body, accidental explosion or fire, when water leaking out, the permit holder of the gems production license or the manager shall report to the ministry or the department of mines within 24 after the event of the accident. Moreover, with **annexure form (5)**, detailed account of the accident shall be reported within a week. A copy of report shall be sent to the ministry of labor in order to take suitable action.
- (b.) The permit holder of the gems production license or the manager as in the above clause (b) except the accident, if a person is absent from work for 48 hours, it shall be recorded in **annexure form (6)**.
- (c) According the above clause (b), a copy of recorded information in the annexure form (6), it shall be sent (7) days after the end of the month to the chief inspector.

## **Chapter (7)**

### **Allowing inspectors in charge and chief inspect to inspect**

22. The permit holder of gems production license or the manager shall allow the inspector in charge or the chief inspector to inspect. When allowing this, the necessary administration arrangement shall be done when going into the gems concession, testing the soil or inspection works.
23. The permit holder of gems production license or the manager shall not stop or prohibit the chief inspector or inspector in charge in accordance with the above clause 22 when doing the inspection work probation, reject to inspect or disturbing by any ways.

## **Chapter (8)**

### **Crime and Punishment**

24. Whoever breaches any provision in this notification clauses 2,3,4,7 and clause 9 – sub clause (a), (b), (c), (d) and (k), clauses 11,12,13,15,19,20 and 23, or fail to abide any of the duties, they shall be charged in accordance with Myanmar Gems Law, Law 43.
25. This notification is promulgated based on the decision of (14/99) times meeting of Management Committee of Ministry of Mines held on the 16 of September 1999.

General Ohn Myint  
Minister  
Ministry of Mines

Letter no 1 sub-group (2) 99 (law)  
Date 1999 October 4

**Distribution**

- The chairman office of State Peace and development council
- The office of State Peace and Development Council
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- All the ministries
- Director general of the Department of Mines
- All the enterprises and the rest of the departments in the Ministry of Mines
- Managing Director, Press and publishing Enterprise , Myanmar Publishing house, request to include in the announcement .

According to command

(U San Thein)  
Head of the office  
Ministry of Mines

**Annexure form (1)**

**Registration book for the workers**

Date recorded	Name	Worker Number or NRC	Age	Male or Female	Type of work	Shift (or) group	Health certificate number	Working time	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

### Annexure form (2)

### Underground mine workers registration list

(On the same line with name of incoming underground mine workers, in the column "In" to show it with the cross) (on the same line with the name of outgoing underground mine workers in the column "Out" to show it with the cross)

Duration of work morning start at this hour  
Evening

Duration of work	morning	end at this hour
Evening		

Begin on 199 , month , end on 199 , month .

[illegible]

Total number of Underground mines workers –

### Notification of working hours

#### One shift system

Name of concession .....

Company name .....

Permit holder name .....

We would like to inform that the people from the below groups, their names and working hours are followed correctly.

Group	Working hours		Rest time		Weekly off day (if any specification)	Remark
	From	To	From	to		

Manager: .....  
Date: .....

### Notification of Weekly working hours

#### Rotational shift system

Name of concession .....

Company name .....

Permit holder name .....

We would like to inform that the following group of people, their names and working time are followed starting from 1999      , month      (      ) date.

Group	Shift number	Working hours		Next week shift number	Rest time when shift is changed	Remarks
		From	to			
	1				Hour	
	2				Hour	
	3				Hour	
	4				Hour	
	5				Hour	

Manager: .....  
Date: .....

**Notification**  
**of the amendment in the workers' registration book**

The following workers have changed their work and for the permanent change of work, it has been registration in the worker's registration book accordingly.

[illegible]

Manager: .....

Date: .....



Accident report

Date .....

To

Chief Inspector

I would like to report an accident happened on the gems concessions .....

Accident that caused deathAccident that caused severe injuriesAccidental explosion or FlameFireWater leakage

And the following related information.

1. Location of the concession (village, township, district, state/division)			
2. Type gems mined			
3. Name of owners and address			
4. Name / male or female			
Death	Injuries	Age	Job
1.			
2.			
5. Date and time of the event			
6. Place of the event			
7. The reason why this happened			
8. Type of event			
9. Amount of damage			
10. Type of injuries, if death the cause of death			
11. Action taken by owner, representatives and manager			

Owner: .....

Representative:.....

Manager: .....

### Instruction

- (1) The method how to send the letter –

In the gems concession, near the gems concession, if severe injuries which can cause death occur suddenly or in the gems concession, near the gems concession, sudden explosion, sudden flame, and fire or water leakage happens, the owner or representatives or manager shall call with the telephone or other way communication to the chief inspector immediately. Within 24 hours, with this form, all the accident information shall be filled and sent it to Chief Inspector.

- (2) According to Electricity Law, Law (33), if death is caused by electricity and injured by it, it shall be reported to Myanmar Electricity inspector chief.



