

***INTERNATIONAL CYANIDE
MANAGEMENT INSTITUTE***

Cyanide Code Recertification Audit

Summary Transportation Audit Report

***Ma'aden Gold & Base Metals
Riyadh, Kingdom of Saudi Arabia
Cyanide Transportation
Saudi Arabia Supply Chain***

3rd – 7th December 2017



Name of Cyanide Consignor : Ma'aden Gold & Base Metals

Name of Responsible Manager: Mr. Yahia M. Al-Shangiti

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Description of operation:

Ma'aden

Ma'aden Gold & Base Metals (MGBM) Co is a subsidiary Company of Saudi Arabia Mining Company (Ma'aden) which was formed on 23 March 1997 and is a Saudi joint stock company for the purpose of facilitating the development of Saudi Arabia's mineral resources. Ma'Aden Gold is focusing on its active gold mining business which has grown in recent years to include the operation of six gold mines: Mahd Ad Dahab, As Suq, Sukhaybarat, Bulghah, Ad Duwayhi and Al Amar. In addition, Ma'Aden is currently working on new gold projects in the central region of Saudi Arabia (Mansourah, Masarrah and Ar Rjum), which are currently under development.

ICMI Consignor Signatory

Ma'Aden Gold and Base Metals Co. became a signatory consignor for the transportation of cyanide in 2014. MGBM has therefore overall responsibility for the transport of cyanide from Rabigh, King Abdullah Port (KAP) to the MGBM mine sites listed on the International Cyanide Management Institute (ICMI) website.

Cyanide Supply Chains

The Saudi Arabian Supply Chain includes the handling of the cyanide containers from the ship to the quay (National Container Terminal Company Ltd and National Port Services Ltd), clearance and customs (Professional Industrial Chemicals Company – "ProChemie"), and transport from the port to the mines (Globe Logistics as a sub-contractor of ProChemie, referred to as "Globe"), with MGBM functioning as the coordinator and client and with ultimate supply chain responsibility. The adjoining Supply Chains are the AGR West Australian Supply Chain from the AGR Kwinana

production facility to Freemantle (recertified 26 September 2016) and the AGR Ocean Supply Chain from Freemantle to KAP (recertified 17 December 2017).

The Due Diligence Review of King Abdullah Port was conducted by AGR on 19 July 2017, the site inspection accompanied by representatives of MGBM, ProChemie, KAP, National Container Terminals, and the MSC shipping line. The Report was reviewed by this audit's Transport Auditor and Lead Auditor and found to meet the basic requirements of a Cyanide Code due diligence exercise.

MGBM Transport Contract

MGBM has a contractual agreement with Professional Industrial Chemicals Co. (ProChemie) to:-

- order and supply solid cyanide from Australian Gold Reagents Co. (AGR) in Australia;
- oversee security and handling at ports of entry including customs clearance; and,
- transport sodium cyanide in MSC freight containers from port to MGBM mine Sites, compliant with requirements that meet the ICMI Transport Code.

MGBM responsibilities under the agreement are (as far as the transport operations are concerned):-

- Maintaining compliance to the ICMC (International Cyanide Management Code) as a Transport signatory;
- Evaluation and selection of transporting routes, assisted by AGR (producer) and the transporter (Globe) from sea port to mine sites;
- maintaining a Cyanide Transport Management Plan (CTMP);
- Unloading at mine sites;
- Assisting ProChemie and Globe in task specific and safety training for the transportation and handling between sea port and mine sites;
- Security from sea port to mine site (assisted by ProChemie and Globe); and
- Emergency response throughout transport from sea port to mine site.

ProChemie responsibilities under the agreement (as far as transport operations are concerned):-

- Assist MGBM in gaining compliance to the ICMC as a Transport signatory;
- Implement requirements of the Cyanide Transport Management Plan (CTMP);
- Storage, unloading, handling and security of containers at sea port;
- Selecting and managing a transporter company to transport freight containers from KAP port to MGBM mine sites in compliance with ICMI Code rules;
- Developing and assisting Globe Logistics in task specific procedures, as required in the CTMP and ICMI Code as well as safety training for transportation and handling between sea port and mine sites;
- Reporting any security issues that may arise from sea port to mine site (assisted by Globe) to MGBM;
- Reporting and assisting in Emergency response throughout transportation from sea port to mine site, where needed; and,



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- Recordkeeping of training and checklists as required in the ICMI Code rules and the Cyanide Transport Management Plan (CTMP).

Globe Logistics responsibilities under the agreement are (as far as transport operations are concerned):-

- Assist MGBM in maintaining compliance to the ICMI as a Transport signatory;
- Implementing requirements of the Cyanide Transport Management Plan;
- Supplying a fleet of well-maintained trucks and trailers to transport cyanide;
- Supplying licensed drivers who are trained and competent in cyanide awareness;
- Having a commitment to complete required documentation as required in the CTMP;
- Reporting any security issues that may arise from sea port to mine site to MGBM; and
- Reporting and assisting in Emergency response throughout transportation from sea port to mine site, to MGBM.



Auditor's Finding

This operation is

X in full compliance

in substantial compliance

not in compliance

with the International Cyanide Management Code.

The operations have not experienced compliance problems during the previous three year audit cycle.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

E-mail: arend@eagleenv.co.za

Name and Signature of Transport Auditor:

Name Lynton Brown


Signature

Date 30/4/2018.

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

Signed

Arend Hoogervorst


Lead Auditor

30/4/2018
Date

1. TRANSPORT: *Transport cyanide in a manner that minimizes the potential for accidents and releases.*

Transport Practice 1.1: Select cyanide transport routes to minimize the potential for accidents and releases.

X in full compliance with

The operation is in substantial compliance with **Transport Practice 1.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

There is no rail system in Saudi Arabia and road transport is the only transport option. The route options to the mines are limited. The selection of routes to the mines is a combined decision taken by Ma'aden Gold and Base Metals Company (MGBM) and the transporter. The routes, are however, approved by the regulator in Saudi Arabia through the HCIS (Higher Commission for Industrial Security). The regulator, through HCIS, has instructed that the authorities will take charge of any incident involving cyanide and coordinate civil defense, police and medical response (Red Crescent). MGBM and its contractor (Globe) will be responsible for undertaking the necessary clean-up operations. The route risk assessments for Mahad Mine, Sukhaybarat Mine, Bulgah Mine, As Suq Mine, Ad Duwayhi and Al Amar Mine are drawn up by Ma'aden with inputs from the contract procurer (ProChemie), the transporter (Globe Logistics) and the producer (Australian Gold Reagents). Route surveys and route risk assessments (approved by HCIS) are included in the Transport Management Plan. Route surveys and route risk assessments include details on population densities, infrastructure road conditions, sandstorms, and weather conditions which might influence safety.

All cyanide deliveries are undertaken in convoys. Route surveys and route risk assessments are used and updated in the convoy reports as new hazards are encountered. MGBM is working with communities, other stakeholders and government agencies as a mining signatory and as a transport signatory. Representatives of the mines are working with communities both adjoining the mines and on the cyanide transport routes. Information on cyanide and the convoys has been forwarded to the Red Crescent and the Civil Defence authorities through the appropriate channels. Evidence of community consultations and discussions with local hospitals at Al Amar was sighted. Liaison and dialogue continues.

Transport Practice 1.2: Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.

X in full compliance with



- The operation is** in substantial compliance with **Transport Practice 1.2**
- not in compliance with

Basis for this Finding/Deficiencies Identified:

The transport company, Globe, employs only licenced drivers and Saudi Arabia requires a licence for those driving trucks. The cyanide producer, AGR, has originally provided cyanide awareness training at Globe Transport for drivers, management and supervisory staff and MGBM has assisted with refresher training. AGR still provides training annually. MGBM has prepared a Cyanide Transport Management Plan (CTMP) which includes specific roles and responsibilities for contractor, Pro-Chemie and sub-contractor, Globe Transport, regarding compliance with the Cyanide Code relating to cyanide transport.

Transport Practice 1.3: Ensure that transport equipment is suitable for the cyanide shipment.

X in full compliance with

- The operation is** in substantial compliance with **Transport Practice 1.3**
- not in compliance with

Basis for this Finding/Deficiencies Identified:

The transport company only transports one 20 foot (28 ton max) container of cyanide on a trailer which is designed to carry 2 Containers. No trailers, at any time, will carry more than one container. This is also a requirement in the CTMP under the sections on Convoy Management and General Driver's Rules.

Transport Practice 1.4: Develop and implement a safety program for transport of cyanide.

X in full compliance with

- The operation is** in substantial compliance **with Transport Practice 1.4**
- not in compliance with

Basis for this Finding/Deficiencies Identified:

A Globe AGR Cyanide Transport Pre-Trip Inspection Check List is completed for all trucks and trailers before the commencement of each cyanide collection and delivery. The CTMP requires the transport company to have a Preventative Maintenance System (PMS) and Globe Transport's logistics and transport system is certified in terms of ISO 9001. The Globe Transport Procedure titled "Maintenance of Equipment - Trucking Division Jeddah" describes a detailed planned maintenance and breakdown maintenance system and includes documentation covering an inventory of Truck/trailers and vehicles,

PMS Record for each vehicle and trailer, Tyre Records, Job Cards, Material Requisition Forms, and Maintenance Inspection records.

The CTMP includes a section covering Driving Hours and Fatigue Management which stipulates maximum driving hours, and minimum rest periods, along with reference to pre-determined stopping points. The CTMP includes a section on the Drugs and Alcohol Policy which requires that all drivers must be in a fit state to work, not under the influence of drugs or alcohol and that convoy leaders must check that drivers are not under doctors' prescriptions which could lead to drowsiness. The use of drugs and alcohol is a criminal offence in the Kingdom of Saudi Arabia.

Containers are loaded by the manufacturer, AGR, and sealed at source and cannot shift. Containers are fixed to the flat bed trailers using twist locks which are checked, pre- and post-trip. The CTMP states that ProChemie is responsible to keep checklist records and training records for at least three years and Globe Logistics is to, similarly, keep GPS records for cyanide convoys and vehicle maintenance records for three years. Packaging and labelling is covered by UN numbering and marine pollutants as per international requirements. There are no additional local labelling requirements to date.

Transport Practice 1.5: Follow international standards for transportation of cyanide by sea and air.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 1.5**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

Shipments of cyanide by sea are covered within producer, AGR's, Ocean Freight Supply Chain recertification, which includes transportation of solid sodium cyanide by ship from Fremantle Port, Western Australia, via the Mediterranean Shipping Company (MSC) and Maersk Australia to various interstate or international ports, published on ICMI website on 17 December 2017. No cyanide shipments are undertaken by air.

Transport Practice 1.6: Track cyanide shipments to prevent losses during transport.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 1.6**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

All drivers are equipped with company-issued mobile telephones. The Pre Trip Check List requires a test of mobile phones before the vehicles depart and includes cellphone, battery and GPS. Globe's cyanide transport vehicles are all linked to a GPS tracking system which refreshes every minute and is monitored at the transporter's offices. One

controller is allocated to every ten vehicles. In the event of a failure of the GPS tracking system, the convoy would be required to report by cellphone hourly. (This situation has only occurred once in 2017 and is an abnormal occurrence.) One section of the Ad Duwayhi Mine route has no cell phone reception at present. The road is well travelled and only travelled by Ad Duwayhi traffic. If the convoys stop for any length of time, this would be picked up by GPS tracking. Other vehicles in the convoy would also react.

Pro-Chemie has a chain of custody document system to track shipments from arrival at the port to delivery at the mine site. On completion of the journey, these records are filed for a minimum of three years. Pro-Chemie, once the shipments arrive and are cleared, issues the documentation covering the cyanide to be delivered to the various sites and issues the safety data sheets (in English and Arabic) to Globe and their drivers.

MGBM has prepared a Cyanide Transport Management Plan which includes specific roles and responsibilities for the contractor, Pro-Chemie and the sub-contractor, Globe Logistics, regarding compliance with the Cyanide Code relating to cyanide transport. The Purchase Order Agreement between MGBM and Pro-Chemie requires compliance with the objectives and principles of the Cyanide Code as it relates to transport and delivery of cyanide.

2. INTERIM STORAGE: Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.

Transport Practice 2.1: Store cyanide in a manner that minimizes the potential for accidental releases.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 2.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

According to the AGR Port Due Diligence Report, the port stevedoring services, NPS (National Port Services), remove the cyanide containing shipping containers from the ship to the wharf side, where they are immediately transferred to the Port's IMDG Code compliant Dangerous Goods Storage Area. The Dangerous Goods Storage Area is managed by NCT (National Container Terminals). They handle all types of containers and goods. The dangerous good yard is laid out by DG (Dangerous Goods) Class and this allows the required segregation of products and classes. The cyanide lay down area, Class 6, is segregated by distance from other Classes; the same segregation exists between all Classes. The cyanide containers are clearly labelled according to IMDG Code requirements, including Product name, UN number, and marine pollutant mark.

No cyanide is transported to or from the transporter's premises so there is no need for signage. The road transporter picks up the sealed cyanide shipping containers directly from the port and takes them directly to the various mines.

According to the AGR Port Due Diligence Report, the Port facility is monitored under the security access into the King Abdullah Economic City (KAEC) area; there is a Coast Guard security gate and a Port/wharf gate. The KAEC and also KAP areas are fenced with security control points. The security escalates with special permits and or authorisations required to advance to the Port or wharf areas. All trucking in and out is controlled by vehicle appointments and documentation for load deliveries or collections. All truck drivers must be in possession of a port pass which is issued to Saudi residents only by the Coastguard Authority. The terminal is a pedestrian free zone. Only authorised people allowed.

NCT's (National Container Terminal's) computer systems take the Vessels manifest and have the ability to identify dangerous goods consignments, determine the class of dangerous goods and establish the segregation requirements for that product. The program will then ensure that the product (containers) is stacked in the correct area and segregation limits, as required by the International Maritime Organization's Dangerous Goods Code, are met.

According to the AGR Port Due Diligence Report, "...The sodium cyanide packaging has a sealed plastic liner which stops the contact of product from moisture or humidity. The packaging is not handled and remains in the shipping containers (sealed) which are placed in the designated area in the storage yard, containers are placed in open air area and are not in a confined space..."

"...The wharf area is prepared to handle heavy vehicles and loads any loss of containment will be captured in a special bunded area within the port confines. Equipped Emergency Response teams are available and support will escalate to the Coast Guard and then National Civil Defence. A fully equipped fire station is located just outside the terminal within the port confines..."

3. EMERGENCY RESPONSE: Protect communities and the environment through the development of emergency response strategies and capabilities

Transport Practice 3.1: Prepare detailed emergency response plans for potential cyanide releases.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 3.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

Responsibility for developing and implementing the Cyanide Transport Emergency Response Plan (CTERP) rests with MGBM. The Cyanide Transport Emergency Response Plan is in place and being implemented. The CTERP was drawn up with specific reference to the route surveys and risk assessments. AGR supplies solid cyanide



briquettes and the CTERP considers primarily dry handling of cyanide with some wet handling if an accident occurs and the spill accesses water.

Specialist cyanide support (technical and physical) is available and accessible to Pro-Chemie, Globe and the Port via Ma'aden Gold head office and mobile specialist knowledge and equipment located at Al Amar mine. AGR, the cyanide producer, also provides a 24 hour/7 day hotline for emergency information and support.

The CTERP identifies six separate scenarios and their appropriate responses. As there is no rail service in Saudi Arabia, the CTERP only refers to trucking via road. The CTERP considers all aspects of the transport infrastructure over which it has the ability and authority to act and respond. The condition of the roads is generally good and they are well maintained. The port is new and the transport infrastructure is reported to be good in the AGR Port Due Diligence Report.

The CTERP only works with a vehicle consisting of a truck and long trailer (standard 40 foot load capacity) with only one 20 foot container ever carried on each trailer. One of the sections in the CTERP covers roles and liaison with the Local Authorities, Traffic Police, Hospitals/Medical Personnel, Fire Departments/Civil Defense and Regulatory Authority (HCIS - Higher Commission for Industrial Security).

Transport Practice 3.2: Designate appropriate response personnel and commit necessary resources for emergency response.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 3.2**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The CTERP has a section which includes a description of the key roles of the Convoy leader, driver, MGBM Incident coordinator, Response Teams from Mine Sites, the Transport Company and the producer (AGR). An Annexure in the CTERP contains an Emergency Response Equipment List per convoy and an Emergency Response Equipment List and maintenance and inspections of Response Equipment, as required in the main body of the CTERP. Initial training has been provided and the training section of the CTERP requires that Globe convoy personnel, drivers, and office personnel are trained in Cyanide Awareness, Convoy Procedures and Emergency Procedures annually. Refresher training records were sighted. MGBM has prepared a Cyanide Transport Management Plan which includes specific roles and responsibilities for the contractor, Pro-Chemie and the sub-contractor, Globe Logistics, regarding compliance with the Cyanide Code relating to cyanide transport and emergency response.

Transport Practice 3.3: Develop procedures for internal and external emergency notification and reporting.

X in full compliance with



The operation is in substantial compliance **with Transport Practice 3.3**

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The CTERP contains a section, Transport Emergency Plan Activation, which includes an internal notification mechanism, and Authority and Resource Mobilisation. The section covering the descriptions of key roles, describes key players and the initial and secondary responses. The section goes on to describe in detail, the roles, communication, responsibilities, and PPE of internal and external role players. The CTERP makes the MGBM Emergency Response Specialist responsible for updating the plan, including contact telephone numbers, and informing all plan holders of any changes. The Situation Appraisal Form was available at Globe Logistics to collect appropriate information from the convoy leader after any accident/incident.

Transport Practice 3.4: Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 3.4**

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The CTERP cross references to the MGBM Cyanide Management Procedure and cyanide emergencies are also covered in the abbreviated Cyanide Emergency Response section within the CTERP. The focus is on dry recovery of all materials and containment and shipping to mines' sites for complete disposal. Neutralisation using hypochlorite is an option to be used in consultation with MGBM and AGR specialists, should spills be affected by liquids. It should be noted that Saudi Arabia is an arid country. However, the CTERP specifically prohibits the addition of cyanide treatment chemicals such as hypochlorite and ferrous sulphate to surface water bodies or a flowing waterway.

Transport Practice 3.5: Periodically evaluate response procedures and capabilities and revise them as needed.

X in full compliance with

The operation is in substantial compliance **with Transport Practice 3.5**

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The CTERP requires that the plan shall be updated as changes take place or at least annually. The plan has been updated twice since the last certification. The Exercises and

Drills section specifies the requirement for emergency response simulation drills, periodically, and a full scale incident scenario with all role players at least once three yearly. Drill reports for man down and road transport drills were sighted for exercises in 2015, 2016 and 2017.

