

Prepared for:



HAZARDOUS MATERIALS MANAGEMENT PLAN

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Prepared by:



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1. SCOPE

The Hazardous Materials Management Plan (HMMP) addresses management of all hazardous solid, liquid and gaseous products procured, used, stored and transported at and around the Kouilou Potash Project infrastructure. These include the plant area, the brine field, the port site, the pumping station, and all utilities corridors.

The HMMP covers both the construction and operational phases of the Kouilou Potash Project. It constitutes the initial document which will be modified and updated as the Project unfolds.

Response to large scale spills occurring outside the operating sites is addressed in the Emergency Response Plan. Disposal of hazardous waste is addressed in the Waste Management Plan.

2. PURPOSE AND ENVIRONMENTAL OBJECTIVES

The HMMP aims to provide guidelines on handling, storing and transportation of dangerous goods in accordance with international best practices to avoid deterioration of the natural environment and negative impact on the health and safety of workers and communities in the Project Area.

The Project currently implements the European classification system for hazardous material as documented by the European Commission Dangerous Substances Directive (67/548/EEC) and plans to migrate to the Globally Harmonized System (GHS) during the first years of operation.

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3. DEFINITIONS AND ABBREVIATIONS

Definitions

Hazardous materials or Dangerous goods: Any solid, liquid, or gas that can harm people, other living organisms, property, or the environment. According to the European Commission Dangerous Substances Directive (67/548/EEC), they are either:

- (a) **explosive:** substances and preparations which may explode under the effect of flame or which are more sensitive to shock or friction than dinitrobenzene;



- (b) **oxidising:** substances and preparations which give rise to highly exothermic reaction when in contact with other substances, particularly flammable substances;



- (c) **easily flammable:** substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition, or liquid substances and preparations having a flash point below 21°C, or gaseous substances and preparations which are flammable in air at normal pressure, or substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities;



- (d) **flammable:** liquid substances and preparations having a flash point between 21°C and 55°C;



- (e) **toxic:** substances and preparations which, if they are inhaled or taken internally, or if they penetrate the skin, may involve serious, acute or chronic health risks and even death;



- (f) **harmful:** substances and preparations which, if they are inhaled or taken internally, or if they penetrate the skin, may involve limited health risks;



(g) **corrosive:** substances and preparations which may, on contact with living tissues, destroy them;



(h) **irritant:** non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation.



(i) **harmful to the environment**



Abbreviations

- CPAR: Corrective-Preventive Action Register
- ESMP: Environmental and Social Management Plan
- H & S: Health and Safety
- HMMP: Hazardous Materials Management Plan
- HSE: Health, Safety and Environment
- MSDS: Material Safety Data Sheet

A material safety data sheet (MSDS) is a sheet containing data regarding the properties of a particular substance. It includes information on physical data such as melting point, boiling point, flash point, etc., on toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill handling procedures. The exact format of an MSDS can vary from source to source. Suppliers of chemicals normally provide MSDS to users.

It is important to use an MSDS that is both country-specific and supplier-specific as the same product, e.g. paints sold under identical brand names by the same company, can have very different formulations in different countries; a product using a generic name, e.g. sugar soap, can also have a formulation and degree of hazard which varies between different manufacturers in the same country.

GHS: Globally Harmonized System

To promote a more consistent communication of information and thereby facilitate the safe use of chemicals and lessen the barriers to trade, the United Nations Conference on Environment and Development (UNCED) agreed at the Earth Summit in Rio de Janeiro in 1992, to develop "a globally harmonized hazard classification and compatible labelling system, including MSDS and easily understandable symbols." This initiative has come to be known as the Globally Harmonized System (GHS).

This implies that classification and MSDS format will be harmonized all over the world. A second revised edition of the GHS was published in July 2007. UNCED intends to implement the GHS as soon as possible.

The 2007 version classification is divided in 3 groups, *i.e.* physical hazards, health hazards and environmental hazards, comprising about eighty hazard categories (Annex 2 of GHS, 2007).

It is possible that some suppliers already use this classification.

SOP: Standard Operational Procedure

UNCED: United Nations Conference on Environment and Development

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4. ACTIVITIES

4.1 Context

Overall, little hazardous material is used or generated during the construction and operational phases of the Project. Hazardous material is mostly used for cooling, power generation or transport purposes. Substances which may be used by the project which exhibit hazardous properties include:

- Drilling fluids;
- Chemicals for laboratory analyses (small quantities);
- Solvents for vehicles repair;
- Bulk fuel and oil, for vehicle fleet and fuel-powered equipment and machinery;
- Refrigerant gases, for cooling and air-conditioning equipment;
- Flammable and combustible liquids;
- Pesticides and herbicides;
- Compressed gases for welding operations;
- Biomedical waste from the clinic;
- Radioactive material used in drill hole data logging equipment.

4.2 Procurement

The procurement department must advise the HSE manager (EPCM during construction and the mine's during operation) of the purchase of hazardous material. Environmentally friendly alternatives will be suggested when available and should be favoured when affordable.

Laboratory chemicals, paints and other maintenance chemicals will be purchased in the minimum quantity required in order to avoid surplus materials requiring storage and disposal.

MSDS sheet must accompany every hazardous material delivery. The warehouse manager is responsible to file these and provide a copy to the site clinic. Upon delivery to site, the Procurement Department will designate any goods and materials as hazardous in the inventory database and will ensure appropriate labelling and storage conditions. An update of newly designated hazardous materials will be forwarded monthly to the HSE Department. All material removed from the inventory will be registered, along with quantities, department of destination and supervisor.

All hazardous materials will be stored in warehouse facilities until needed, except bulk fuel and oil.

Limited quantities of herbicides will be stored onsite, mostly for landscaping purposes. Pesticides will be provided by specialized contractors will for pest control services.

The Maintenance Superintendent will ensure that purchase and elimination of refrigerant gases is done in compliance with the Congolese laws and internationally recognised best practices.

Procurement of hazardous materials will be reviewed periodically to ensure that alternative environmentally friendly materials are being purchased and used when possible.

4.3 Labelling

The Procurement Department will ensure that all hazardous products, goods and materials are received in original containers with appropriate labels

Every superintendant will ensure the identification of any container in which hazardous products, goods and materials are transferred. The identification will be done with appropriate labels and pictograms. Each superintendant will ensure that wherever hazardous materials are used, handled or stored, a "key" of labelling symbols and definitions is posted and is accessible to employees from each department and that they are trained in what the symbols mean.

4.4 MSDS

The HSE Department will ensure that up to date MSDSs are available to workers using any hazardous material. An electronic or paper copy will be kept at the location of storage and use, and also at the Project's medical clinic.

The HSE Department will conduct appropriate training on MSDS interpretation.

4.5 Handling

The supervisor of any worker and/or activity involving hazardous materials will ensure that the hazardous material is being handled as per the manufacturer's instructions or the MSDS information and that workers are aware of risks and have appropriate training and safety equipment. Supervisors will also verify that workers are familiar with the appropriate hazardous materials spill response procedures as defined in section 4.8.

4.6 Storing

The warehouse supervisor and any supervisor who is responsible for using, handling or storing hazardous materials in their working area will ensure that any hazardous materials under their supervision are being stored as per the manufacturer's instructions or the MSDS information. Appropriate storage facility safety features will be in place, which may include storing hazardous material:

- In secure areas inaccessible to unauthorised or untrained people;
- Not stacked;
- In a ventilated area;
- In a way that incompatible materials are stored separately;
- In a controlled temperature area, if necessary;
- On an adequate storage floor, e.g. concrete slab;
- Protected from contact with moving equipment;
- In approved secondary containers.

In the warehouse, hazardous materials will be stored separately from other materials in an identified and access-controlled area equipped with appropriate fire and spill response equipment, and a posted "key" of labelling symbols and definitions. The area will be covered, ventilated and will have a concrete floor with a sump to collect potential spills.

Original containers of hazardous materials will be used whenever possible. If not possible, cleaned and labelled appropriate containers that will not react with the intended content will be used, e.g. acids will not be stored in metal containers.

4.7 Transportation

Transportation of any hazardous material to a Project site will be performed by the supplier or other logistics services. The Procurement Department will ensure that the drivers have been trained properly, are equipped to respond to spills, and that the transport vehicles are properly identified as transporting the specific hazardous material.

For small quantities of hazardous materials moved within the Project's site limits, the warehouse attendant will verify, prior to releasing the hazardous materials, that the involved personnel has been trained in response to spills and that the vehicle is adequate for transport of material, e.g. compressed cylinders must be secured.

All fuel trucks and trucks used for transportation of hazardous materials will be equipped with a spill kit and fire extinguisher of type and size appropriate to the material being transported and will be labelled.

4.8 Spill Prevention and Response

A spill is the unauthorized, unplanned and uncontrolled release of a hazardous substance to the environment. Spill of more than 25L or that affect a surface of more than 25 m² must be reported to the HSE department.

Measures to avoid spills must be implemented by all project workers. These include:

- Scheduled maintenance of equipment;
- Appropriate packaging and labelling of hazardous material;
- Storage as per manufacturer recommendation in protected areas (*i.e.* drums should not be left in the middle of a work area where they can be knocked over by mobile equipment.);
- Use of appropriate handling equipment and respect of handling procedure;
- Appropriate tie down of containers on transport vehicle and respect of traffic code.

Should a spill occur during transport of hazardous material outside the site boundaries, the procedures outlined in the Emergency Response Plan will be implemented. To prevent spills all contractors transporting hazardous material must comply with Congolese regulation and requirements outlined in their contract with MagMinerals. Every vehicle transporting hazardous material shall be equipped with spill clean-up material appropriate to the substance transported and the driver must be trained in clean-up. Driver must have a means of communicating with his supervisor and/or the project HSE manager. All spills must be declared immediately.

During construction, the General Contractor is responsible for the implementation of spill prevention measures, the supply of spill cleanup material and the disposal of contaminated material in compliance with Congolese legislation and in a manner approved by the HSE department.

In the event of an environmental spill, the following procedure must be applied:

- Advise HSE Manager immediately; in case of large spill, the HSE Manager will request collaboration of the Risk Manager;
- Identify and control the source of contamination;
- Turn off all engines and other sources of ignition;

- Confine the spilled product and prevent it from reaching sensitive areas. Use soil dykes, designated absorbent material or any other appropriate measure;
- Wear appropriate PPE prior to handling spill substance and contaminated material;
- Collect contaminated soil, water or material and securely store (in enclosed barrels, sealed containers, sealed membranes, etc.) in a temporary storage site designated by HSE manager;
- Perform characterization studies as required to determine level of contamination;
- Treat or dispose of contaminated material as approved by the HSE Manager;
- Provide quantity and location of disposed contaminated material to Client HSE Manager;
- Complete incident report and transmit it to HSE Manager within 24 hours of incident.

Report shall include the following information:

- Material spilled;
- Quantity spilled;
- Surface area affected;
- Location of spill;
- Date and time of spill;
- Description of circumstances leading to spill;
- Description of measures taken to contain-clean-up spill;
- Adverse effect observed on people's health or environment;
- Photos should be attached whenever possible.

4.9 Disposal of Hazardous Materials and Wastes

Hazardous waste includes contaminated or toxic waste, such as spoiled rags, spoiled parts, empty containers of hazardous material, used batteries, fluorescent bulbs, waste solvents, dusts, or ink cartridges. Hazardous waste sorting and disposal is detailed in the Waste Management Plan. Hazardous waste will be collected and stored in watertight containers to be eliminated by specialised contractors.

4.10 Training and Communication

The HSE Department will provide general training on labelling, MSDS interpretation, handling, storage and spill response.

Each department head is responsible to train departmental personnel on storage, handling, disposal of hazardous material and emergency response procedures specific to their tasks and responsibilities. Training records will be kept in the employees' personnel files in the Human Resource Department.

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5. PERFORMANCE MONITORING

5.1 Site Inspections

Sites inspections will be performed by the HSE Department. Project sites will be divided by sectors and will be inspected on a continuous basis with a formally-documented inspection each month. Inspections will ensure that all commitments from this HMMP are being enforced and that specific hazardous material management elements are verified. The warehouse attendant will conduct a monthly inspection of the hazardous material storage area to verify the adequate management of hazardous materials and to correct any discrepancy with this HMMP.

5.2 Internal Audits

The verification made during internal audits will include:

- Communication between departments as per management plan commitments;
- Identification of hazardous materials containers;
- Application of SOPs related to transportation;
- Correlation, between products, goods, materials on shelf, in the inventory database and in the MSDS database;
- Correlation between usage of hazardous materials and training.

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6. PERFORMANCE INDICATORS

Measurement is an important tool in improving performance, and performance indicators help organisations to define and measure progress towards their goals. The results reflect current conditions and allow orientation and coordination of further actions towards sustainable exploitation.

6.1 MTE Notices of infraction

MTE officers may visit the Project facilities at their convenience or if a complaint is filed. They will inspect compliance of the Project with the conditions set in the environmental permit and authorizations. Any significant discrepancy will be reported through a notice of infraction.

The Project's goal is to maintain a track record without any infringements. This indicator is not specific to the HMMP, but to all facets of the Environmental and Social Management Plan (ESMS).

6.2 Environmental Audit Results

Environmental auditing is a key process in the implementation of the ESMS. Internal and external auditing procedures are described in Section 11 of the ESMS main document. The findings of each audit are registered in the CPAR database, where corrective and/or preventive actions are prescribed, responsibilities assigned to people, deadlines established and necessary resources mobilised.

In compliance with the procedure, audit reports shall categorise the findings as being either "major", "minor" or "observation". The number of findings should decrease every year until the ultimate goal of zero major findings is achieved. This indicator is not specific to the HMMP, but to all facets of the ESMS.

6.3 Inventory of Hazardous Products

In order to reduce risk, it will be constantly sought to minimise the number and quantity of different hazardous products, goods and materials used by the Project.

The first three years of the operational phase will serve as baseline data. The amounts of hazardous material used by each department will be examined yearly and opportunities for replacement, reduction or reuse will be determined. Specific targets will be determined.

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7. RESPONSIBILITIES

The responsibilities of the HMMP interveners are presented herein (Table 1).

The HSE Department is responsible for:

- Site inspections;
- Provide internationally recognised labels for hazardous materials containers;
- Train workers on safe handle of hazardous material, MSDS interpretation and spill response;
- Conduct hazmat audits and identify environmentally friendly alternatives or opportunity to reduce use of hazmat.

The Procurement Department is responsible for:

- Purchasing products, goods and materials which are consistent with the Project's environmental policies and objectives, and with the ESMS goals;
- Obtaining MSDS from suppliers and keep registry up to date;
- Designating and identifying hazardous materials upon reception;
- Ensuring safe storage of hazardous products, goods and materials as per MSDS prescriptions;
- Maintain updated MSDSs for each hazardous material and ensure they are available to workers;
- Updating hazardous material inventory database;
- Conducting monthly inspections of the hazardous material storage warehouse.

The Maintenance Department is responsible for:

- Managing the bulk fuel and oil;
- Ensuring management and elimination of refrigerant gases in compliance with the Congolese laws and international best practices.

Every supervisor is responsible for:

- Ensuring that hazardous materials in his/her working area are being used, handled and stored as per the manufacturer's instructions or the MSDS information.

Table 1 Implementation Responsibilities for the Hazardous Materials Management Plan.

Objective / Action	Activity	Intervener												
		Site General Manager	Risk & asset Protection Officer	Community Liaison Officer	HSEC Director	HSE Manager	Procurement Office	Environment Technicians	General Services	Warehouse Attendant	HSE Officer	Mechanical Department	All Supervisors	All Employees
Procurement														
	Purchase of hazardous goods and materials					A	E						P	
	Keep inventory updated with hazardous products identified					A	E		P					
	Identify health, safety and environmental hazards of materials					A				E				
Labelling														
	Verify incoming products labels						P		E	P		P		
	Prepare and provide hazardous materials labels									E				
	Designate and label hazardous materials upon reception					A	P		E			P		
	Label secondary containers					A			E	P		E		
MSDS														
	Obtain MSDS from suppliers						E		P	P				
	Keep MSDS database updated and available to workers					A			P	E				
Handling, Storage and Transportation														
	Maintain storage area							P	E					
	Ensure safe storage of materials as per MSDS prescriptions						E		P			P		
	Review qualification of workers prior to releasing goods from warehouse								E			P		
	Verify vehicles for appropriate transport of materials						E				P			P
Training and Communications														
	Provide general training on MSDS, labelling and procedures						E			P			P	
	Provide substance specific training					A				P		E	P	
Spill Response														
	Spill kit preparation					A			P	E		P		E
	Elaborate spill response training	P				A				E				
	Provide spill response training					A		P		E			P	P
Monitoring														
	Conduct site and records inspections					A				E				
	Conduct internal audit	P			P	E				P				

Legend: E Executes
P Participates
A Approves

8. SCHEDULE AND BUDGET

Management of hazardous material is a continuous activity; it starts during the construction phase, and will continue until closure. An implementation schedule is defined for the various activities of the HMMP (Table 2).

All costs related to the implementation of the HMMP are included in operational running costs. The management of hazardous materials mainly requires internal training and requires implementation of procedure.

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Table 2 Implementation Schedule for the Hazardous Materials Management Plan.

	PRIOR CONSTRUCTION	DURING CONSTRUCTION	PRIOR TO OPERATION	AS REQUIRED	UPON DELIVERY	UPON NEW HIRE	WEEKLY	MONTHLY	QUARTERLY	YEARLY	CONTINUOUSLY
Procurement											
Purchase of hazardous products				X							
Keep inventory updated with hazardous products identified											X
Labelling											
Verify incoming products label					X						
Prepare hazmat labels				X							
Label secondary containers				X							
MSDS											
Obtain MSDS from supplier					X						
Keep MSDS database updated											X
Handling and Storing											
Build storage area		X	X								
Maintain storage area											X
Reviews competence of worker prior to releasing goods from warehouse				X							
Training											
Provide general training on MSDS, labelling and procedures				X		X				X	
Provide substance specific training				X		X				X	
Spill response											
Spill kit preparation	X		X								
Elaborate spill response training	X		X								
Provide spill response training						X				X	
Monitoring											
Conduct site and records inspection				X				X			
Conduct internal audit										X	

9. LIST OF SOPs

- Site inspections;
- Warehouse inspections;
- Reception of hazardous materials;
- Transportation of hazardous materials.

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10. RECORD KEEPING

The records related to the HMMP will include:

- Audit reports;
- Training records;
- MTE notices;
- Site inspection forms:
 - Plant;
 - Brine field and associated pipelines;
 - Pumping station;
 - Port facilities;
 - Waste management centre and landfill;
 - Electrical lines, pipelines and railway corridors.
- Hazardous materials Inventory database;
- MSDS database;
- Hazardous materials spills, leakage or container damage reports.

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11. REFERENCES

European Commission Dangerous Substances Directive (67/548/EEC).

GHS, 2007 annex 2 Classification and labelling summary tables.

<http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/ghs-sgh-eng.php-top#top>

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