



KUDZ ZE KAYAH PROJECT

CONCEPTUAL CYANIDE MANAGEMENT PLAN

May 2018

Prepared for:



BMC MINERALS (No.1) LTD.

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LIST OF ACRONYMS

ANSI	American National Standards Institute
BC	British Columbia
BMC	BMC Minerals (No. 1) Ltd.
CANUTEC	Canadian Transport Emergency Centre
CMP	Crisis Management Plan
Cyanide Code	International Cyanide Management Code
ERT	Emergency Response Team
HCN	Hydrogen Cyanide Gas
HSERP	Health, Safety and Emergency Response Plan
ICMI	International Cyanide Management Institute
Kaska	Kaska First Nation
km	Kilometre
MMER	Metal Mine Effluent Regulations
MSDS	Material Safety Data Sheets
Mtpa	Million Tonnes per Annum
NaCN	Sodium Cyanide
OIC	Order in Council
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
ROM	Run of Mine
RSY	Revised Statutes of Yukon
SAG	Semi-Autogenous Grinding
SC	Statutes of Canada
SOP	Standard Operating Procedures
SOR	Statutory Orders and Regulations
SY	Statutes of Yukon
t	Tonnes
TDG	<i>Transportation of Dangerous Goods Act</i>
TEAP	Transportation Emergency Assistance Program
the Plan	Cyanide Management Plan
the Project	Kudz Ze Kayah Project
tpd	Tonne per Day
VMS	Volcanogenic Massive Sulphide
WHMIS	Workplace Hazardous Materials Information System
YESAA	<i>Yukon Environmental and Socio-economic Assessment Act</i>
YG	Yukon Government

1 INTRODUCTION

BMC Minerals (No.1) Ltd. (BMC) is proposing to develop the Kudz Ze Kayah Project (the Project) an open pit/underground copper, lead, and zinc mine. The Project is located approximately 115 kilometres southeast of Ross River, Yukon within the Kaska First Nation (Kaska) Traditional Territory.

BMC proposes to mine the ABM Deposit, made up of the ABM Zone and the Krakatoa Zone. The ABM Deposit is a polymetallic volcanogenic massive sulphide (VMS) deposit containing economic concentrations of copper, lead, zinc, gold, and silver. Mining is planned to be conducted via both open pit and underground mining methods, with ore processed into separate copper, lead, and zinc concentrates via sequential flotation through a nominal 2 million tonnes per annum (Mtpa) processing plant.

The Project will have a nominal 5,500 tonne per day (tpd) throughput over an approximate 10-year mine life. The various Project phases include:

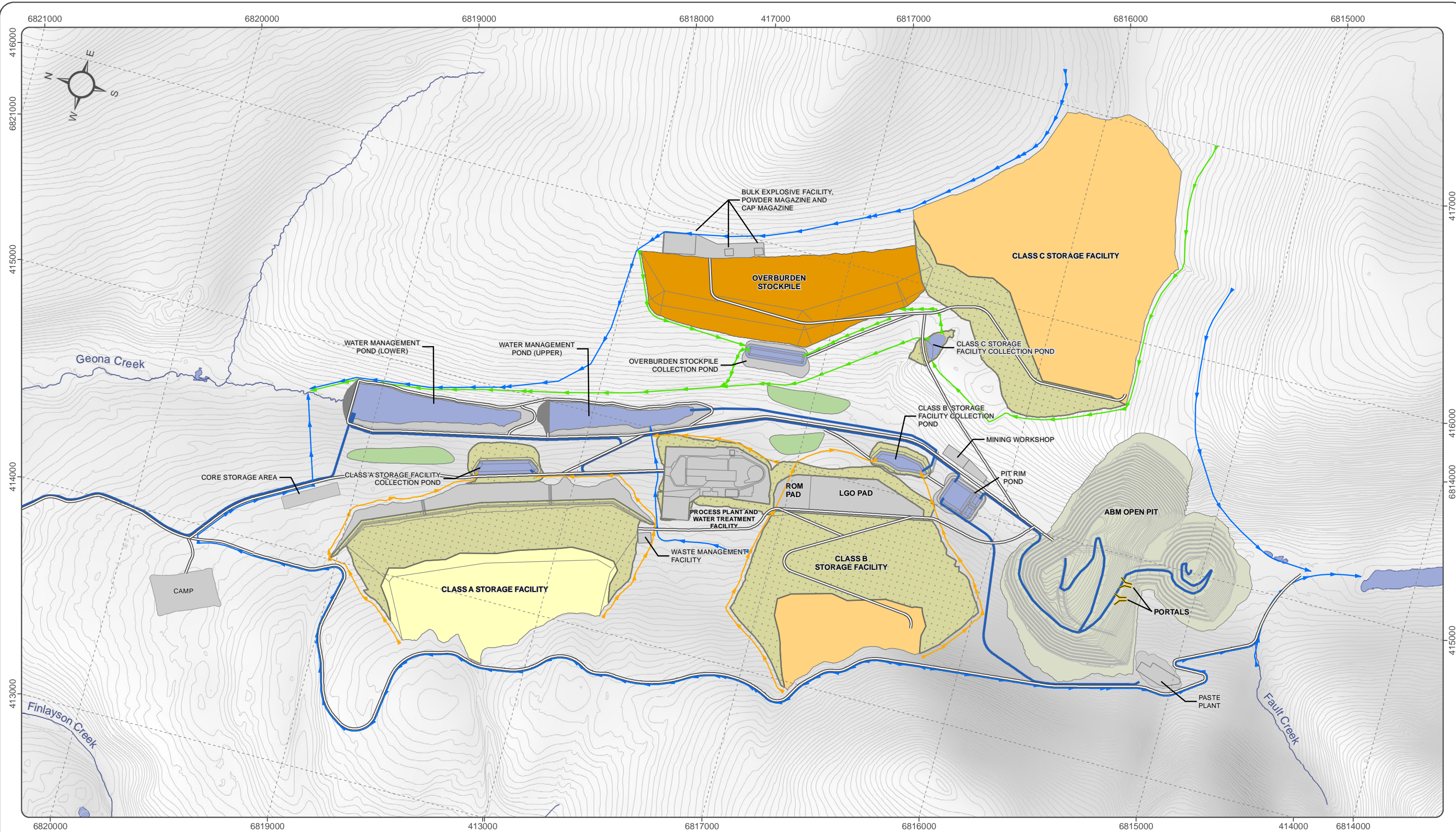
- Construction Phase: will last approximately two years and includes site preparation and clearing and establishment of Project infrastructure;
- Operations Phase: will last approximately 10 years and includes open pit and underground mining and ore processing;
- Decommissioning, Reclamation and Closure Phase (referred to collectively as the closure phase): will last approximately three years; and
- Post-closure Phase: is assumed to begin once all closure activities have finished onsite and will continue until active monitoring is no longer required; the phase is split into two periods: a transitional 13-year period during which the ABM open pit continues to fill, ending when the ABM lake begins to spill to Geona Creek (assumed 16 years for the pit to fill following the end of operations) and a 10-year post-closure monitoring period.

On site surface infrastructure is shown in Figure 1-1, and will include:

- Open-pit mine and underground mine (portal access from within the open pit);
- Processing facility and associated run of mine (ROM) and low grade stockpile facilities;
- Paste backfill plant;
- Three waste storage facilities for tailings and waste rock (Class A, Class B, and Class C). Waste rock will be placed in different storage facilities based on its assessed potential for generation of acidic drainage and metal leaching;
- Overburden and topsoil stockpiles that will be used for progressive reclamation and for final closure;

- Water management infrastructure, including a Pit Rim Pond for mine dewatering, water collection ponds, Operations Water Management Ponds (Upper and Lower), water treatment plant, and surface water diversion ditches;
- Camp facilities;
- Core shack and core storage;
- Waste management facility that will include an incinerator, a small Land Treatment Facility, and a small landfill area;
- General mine infrastructure including an explosives facility, workshops, and fuel facilities; and
- A 24 km Access Road that connects to the Robert Campbell Highway at ~km 234.

The mine will produce an average of 180,000 tonnes (t) zinc, 60,000 t copper, and 35,000 t lead concentrates annually. Concentrate will be transported 911 km to the port of Stewart, British Columbia (BC) for export via Highway 4 south (Robert Campbell Highway) to Watson Lake and Highway 37 south. Upgrades to the existing 24 km Tote Road that runs from the Robert Campbell Highway to the Project site will be conducted to support Project activities.



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Datum: NAD 83. Map Projection: UTM Zone 8N

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1:17,000 (when printed on 11 x 17 inch paper)

0 250 500 750 Metres

- Class A Storage Facility
- Class B and C Storage Facility
- Overburden Stockpile
- Topsoil Stockpile
- Progressive Reclamation
- Pond/Water
- Non Contact Diversion
- Contact Class A & B Diversion
- Contact Class C Diversion
- Pipeline
- Proposed Mine Road



KUDZ ZE KAYAH PROJECT

FIGURE 1-3
PROJECT MINE SITE LAYOUT (YEAR 10)

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1.1 CYANIDE MANAGEMENT PLAN DESCRIPTION

The Project will process ore through a traditional flotation process, consisting of primary crushing, semi-autogenous grinding (SAG) milling / ball milling, gravity gold recovery, flotation of copper, lead and zinc, and concentrate thickening and filtration. Sodium cyanide will be used as a depressant in the lead flotation circuit.

The purpose of this conceptual Cyanide Management Plan (the Plan) is to describe the measures BMC will implement to minimize the risk to the public, employees, contractors, and the environment from the use of cyanide in the production process.

This Plan focuses on the safe management of cyanide throughout all aspects of the Project's life cycle, and includes commitments on the transportation of cyanide to site, storage on-site, usage in flotation operations, and health and safety precautions, including worker training and spill response.

This Plan has been detailed at a conceptual level to inform the assessment of effects currently underway at a Screening level under the *Yukon Environmental and Socio-economic Assessment Act* (YESAA), and will be updated and subsequently provided in conjunction with several other plans to meet the requirements for a Quartz Mining License application and a Water Use Licence application under the *Quartz Mining Act* and the *Waters Act*, respectively. This Plan has also been written to include recommended practices under the International Cyanide Management Code (Cyanide Code) (International Cyanide Management Institute (ICMI), 2018).

This Plan will be updated over the life of the Project, based on changes that may result from:

- Changes to the milling and/or mining processes;
- Regulatory changes specified in Federal or Territorial Acts or Regulations, including the Metal Mine Effluent Regulations (MMER);
- Regulatory changes specified in the Quartz Mining Licence or Water Use Licence;
- Changes to the International Cyanide Management Code;
- Periodic internal and external review of the Plan;
- Change in the company supplying the cyanide or change in the transportation route; or
- Consultation with government regulators, First Nations, communities and public, leading to requests for inclusions and/or changes to the Plan.

1.2 TERRITORIAL AND FEDERAL ACTS AND REGULATIONS

Sodium cyanide is classified as a hazardous material. Both federal and territorial legislation regulate the management of hazardous materials in Yukon. A number of acts, regulations, and guidelines provide specific requirements for the management of cyanide. These include but are not limited to:

Federal Acts:

- *Fisheries Act*, Section 36 and Part 2, 7(1) of the Metal Mining Effluent Regulations (SOR/2002-222);
- *Transportation of Dangerous Goods Act*, SC 1992, c. 34, and Regulations; and
- *Canadian Environmental Protection Act*, SC 1999 c. 33, and Regulations.

Yukon Acts:

- *Occupational Health and Safety Act*, RSY 2002, c. 159, and Regulations;
- *Dangerous Goods Transportation Act*, RSY 2002, c. 50, and Regulations;
- *Environment Act*, RSY 2002, c.50, and Storage Tank Regulations; and
- *Quartz Mining Act*, SY 2003 c. 14, and Quartz Mining Land Use Regulation (OIC 2003/64).

The management of cyanide, as outlined in this Plan, will be in accordance with the above, and, as necessary, other applicable Territorial and Federal Acts and Regulations.

1.3 INTERNATIONAL CYANIDE MANAGEMENT CODE

The Cyanide Code focuses exclusively on the safe management of cyanide that is produced, transported and used for the recovery of gold and silver. Companies that adopt the Cyanide Code are subject to auditing by an independent third party to determine the status of implementation and may result in certification under the Cyanide Code. Audit results are made public to inform stakeholders of the status of cyanide management practices at the certified operation (ICMI, 2018).

The Cyanide Code addresses the production of cyanide, its transport from the producer to the mine; its on-site storage and use; decommissioning and financial assurance; worker safety; emergency response; training; stakeholder involvement; and verification of implementation. The Cyanide Code is a voluntary industry program developed through a multi-stakeholder dialogue under the auspices of the United Nations Environment Program and administered by the International Cyanide Management Institute.

While not signatories, as the Project is not a gold or silver mining operation, BMC has committed to upholding the principles and standards of practice of the Cyanide Code, including:

- Designing and constructing unloading, storage, mixing and transfer facilities consistent with sound, accepted engineering practices and quality control and quality assurance procedures, spill prevention and spill containment measures;
- Operate unloading, storage, mixing and transfer facilities using inspections, preventative maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures;
- Developing standard operating procedures for the handling, storage, and use of cyanide;
- Providing appropriate training to all workers involved in storing, handling, and mixing cyanide and all workers will wear personal hydrogen cyanide gas monitors and appropriate personal protective equipment (PPE);
- Provide spill prevention or containment measures for process tanks and pipelines; and
- Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

2 CYANIDE TRANSPORTATION

To ensure the protection of communities and the environment during transport of cyanide to the Project, the following Cyanide Code standards of practice will be followed:

- Responsibility for safety, security, release prevention, training, and emergency response will be established in written agreements with producers, distributors and transporters; and
- Emergency response plans and management measures will be implemented by cyanide transporters.

Sodium cyanide (NaCN) can be produced and transported to site in a number of forms, including as briquettes in 1 tonne bulk bags or 20 tonne sparge boxes or as liquid cyanide in 1,000 litre bulk liquid boxes. BMC expects that the most likely form of delivery will be in briquette form (Figure 2-1), although as the project and manufacturing technology continues to advance this may be revised to better suit operational and safety requirements. The briquettes will be delivered in 1,000 kg bulk bags, packed in plywood pallet crates and transported to the Project site in standard steel intermodal containers, 20 bags to a container (Figure 2-2). The containers will be sealed and shipped to site by truck. BMC will select a North American producer to provide management of the entire supply chain for cyanide production and transport. In addition to supplying the cyanide required by the Project, the producer will assume responsibility for the transport of the NaCN to the mine site via the Access Road. The transporter will also assume responsibility for the return of the empty containers to the supplier's operations. Although the supplier has not been determined, comparable details of the sodium cyanide to be used at the Project are provided in Appendix A.



Figure 2-1: NaCN Briquettes¹

¹ Image from <http://info.noahtech.com/blog/turning-cyanide-into-gold-sodium-cyanide-applications-in-mining>



Figure 2-2: Typical NaCN Transport container

Transportation of sodium cyanide to the Project will comply with the *Transportation of Dangerous Goods Act* and *Transportation of Dangerous Goods Regulations*. Transportation of dangerous goods is regulated under the *Dangerous Goods Transportation Act*, which requires transporters to have a certified contractor and a spill response plan for all goods to be transported. The transporter will be required to ensure:

- MSDSs accompany all goods and materials;
- Non-compatible materials will be transported in separate shipments;
- Fire extinguisher and fire prevention materials will be adequate and appropriate for the material being transported;
- Containers will be appropriate for the material being shipped;
- Containers will be properly secured;
- Containers and trucks will be properly marked, labelled, and placarded;
- Manifests will be maintained in accordance with federal, territorial (Yukon), and provincial (BC) regulations;

- Spill response materials will be adequate and appropriate for the materials being transported; and
- Drivers will be adequately trained and equipped for spill first response, containment, and communication.

All BMC employees and contractors using the Access Road will be equipped with a radio set to the Access Road frequency, which will be posted on the information sign at the turn off from the Robert Campbell Highway. Line-of-sight radio communication will also provide communications between vehicles within close proximity to each other.

Upon arrival at the Project site, the NaCN container trucks will be guided by mine staff to the purpose-built reagent storage area. Custody of the shipping container and its contents will pass to BMC at the mine site. All cyanide brought on-site will be recorded in an Inventory Register to confirm all containers were safely delivered and are accounted for. Material Safety Data Sheets (MSDS – Appendix A) for solid NaCN, solution NaCN, and hydrogen cyanide gas (HCN) will also be included in the Inventory Register. The purpose of the Inventory Register is to facilitate efficient audit functions, as well as for environmental and safety management. Empty containers will be backhauled to the suppliers' facility for re-use.

A written Emergency Response Assistance Plan will be developed by the producer/transporter. The Emergency Response Assistance Plan will outline strategies in the event of an emergency and will include procedures and current contact information for notifying the transporter's home base, the Project site, regulatory agencies, medical facilities and potentially-affected communities. The trucks will carry health and safety equipment, and spill response supplies to be used in the event of an accident or loss of product. Safety is a paramount concern and the driver will have training in responding to spills while wearing appropriate PPE. The Emergency Response Assistance Plan will be provided to and reviewed by BMC. A copy of the transporter's Emergency Response Assistance Plan will also be provided to the mine's Emergency Response Team (ERT) for their use, should they need to respond to an incident involving a truck carrying cyanide.

If a transportation accident were to occur, the driver will contact his or her home office and the Project site, even if NaCN was not spilled. The information that will be provided includes the name of the driver, location and nature of the accident, proximity to surface water, the nature of any injuries, amount of material released, if any, weather conditions, and proximity to a populated area. In the event of a spill, the driver will follow proper spill response and spill reporting procedures, and will report the spill to the relevant provincial or territorial jurisdiction in which the event occurred, in accordance with Territorial, Provincial and Federal requirements (Section 6).

3 CYANIDE HANDLING, STORAGE, AND USE

Measures implemented during cyanide handling, storage, and use at the Project will be in accordance with the following principles of the Cyanide Code:

- Protect people and the environment during cyanide handling and storage; and
- Manage cyanide process solutions and waste streams to protect human health and the environment.

General handling and storage measures that will be implemented to avoid, control, and mitigate risk include:

- Manufacturers will provide safe packaging and labelling for packaged materials, as a condition of purchase agreements;
- Storage areas will be appropriately climate-controlled, dry, and well-ventilated;
- Storage for transport will utilise a “triple sealed” methodology; sealed bags inside wood packing boxes inside a sealed sea container.
- Containers holding the materials will remain sealed to prevent accidental leakage and/or spillage;
- Incompatible chemicals will be stored separately to prevent deleterious chemical reactions and cross contamination;
- Chemical storage areas will be designated as non-smoking areas and located away from food storage areas;
- All personnel handling dangerous goods will be trained and provided with appropriate PPE; and
- All bulk chemical storage sites will be outfitted with concrete or lined floors and will be bunded with walls capable of containing 110% of the volume of the largest vessel in the area or as stipulated by appropriate legislation or permits.

Solid sodium cyanide will be stored within the delivered packaging in the reagent storage area on the eastern side of the main processing plant building (Figure 3-1) until required for use. The reagent storage shed will be a steel framed structure with metal roofing; metal siding will be installed to keep reagents dry and protected from the sun and elements. Sodium cyanide will be stored within the facility and shall be mixed in dedicated reagent tanks to a 10% solution and transferred to distribution tanks for process use. Equipment for mixing of cyanide will include a fully enclosed bag splitter (with entry doors for the bag), equipped with a dust hood, a vent fan, and a dust filter. During mixing the hood and ventilation equipment will operate under negative pressure so that no airborne NaCN dust can be released.

The reagent storage tank will be equipped with volume level indicators and instrumentation to ensure that spills do not occur during operation. The reagent, mixing and distribution area will be designed as a wet area, with sloped concrete floors draining to sumps for containment. A dedicated

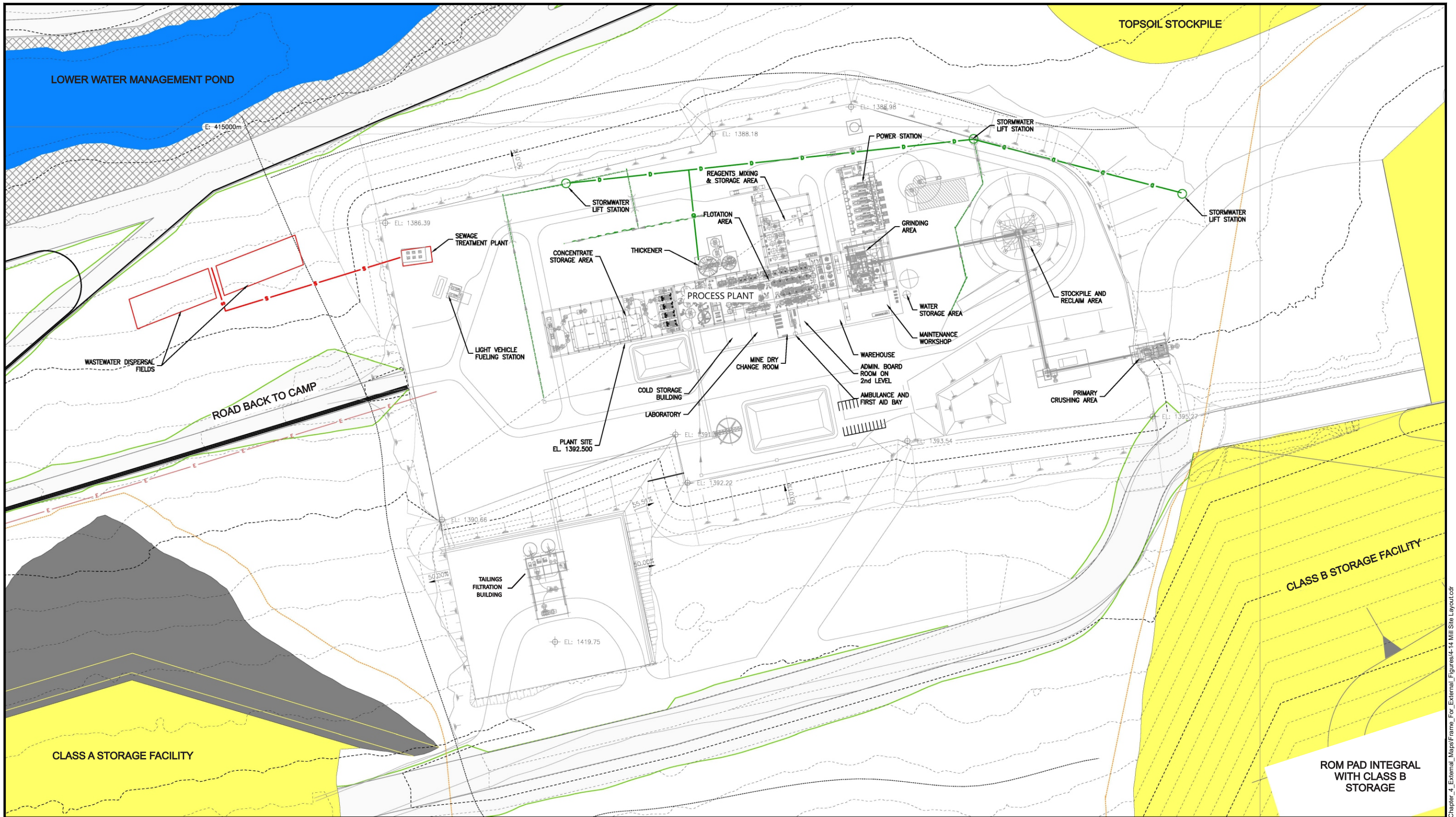
spillage sump and a spillage pump will return spillage from the sump to the mixing tank for re-use in the plant. The mixing and holding tanks will be equipped with ventilation fan systems that vent out to the atmosphere.

All tanks, piping, valves, and secondary containment structures will be subject to regular inspections. As is normal for a facility of this type:

- Standard operating procedures for preventive maintenance will be developed for all aspects of the process plant;
- Tanks and pipeline inspections will center on signs of corrosion or leakage, and legibility of labels, colour-coding or other markings indicating pipeline contents and direction of flow;
- Secondary containment and associated piping will be inspected for signs of cracks or leakage, and presence of fluids. If deficiencies are found or the presence of fluids noted, follow-up corrective actions will be initiated and tracked;
- Records of the inspections and corrective actions will be retained on-site. The mixing facility will have a stationary HCN gas monitor, set to alarm at 10 ppm, and a video monitoring system that will be connected to the process plant control room;
- Cyanide antidote and other first aid equipment will be located at the mixing facility.
- A carmoisine dye, which is non-hazardous, will be added to the storage tank to give the solution a highly visible red colour; and
- The storage tank will also have overflow and tank level indicators monitored in the control room and this will be set to produce an alarm should the solution level become too high.

Unloading and storage area design drawings will be prepared for construction of the facilities as required by the Yukon Water Licence and Yukon Quartz Mining License applications. These designs will include:

- Details on use of level indicators and alarms;
- Foundation characteristics (e.g., seepage prevention);
- Details on methods to separate the cyanide from incompatible materials such as acids, strong oxidizers, etc.;
- Employee safe-handling training and PPE;
- Fire suppression equipment; and
- Waste disposal methods (empty cyanide containers).



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CONCEPTUAL DRAWING; FEATURES ARE NOT TO SCALE



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KUDZ ZE KAYAH PROJECT

FIGURE 3 - 1
PROCESS PLANT FACILITY
LAYOUT

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4 PERSONAL PROTECTIVE EQUIPMENT (PPE) AND WORKER SAFETY

BMC will provide PPE to its employees, and contractors will be required to supply PPE to their on-site employees. At a minimum, all employees and contractors will be required to wear a hard hat, reflective vest or markings, safety glasses, and steel toed boots when on-site, with the exception of the offices, dining, and accommodation complex. Depending on the work location, protective gloves, hearing protection, and coveralls may also be required. These represent the basic starting point in supplying workers with the protective gear required for work on the Project site.

At no time will employees need to physically handle the solid NaCN. However, BMC will provide employees involved in the storage, handling and mixing of cyanide appropriate equipment including PPE specific to cyanide management as follows:

- **Eyes:** Impact resistant chemical protective goggles, face-shield with brow;
- **Skin:** Natural Rubber, Nitrile, Polychloroprene with natural latex rubber, PVC. Wear chemical protective suit; and
- **Respiration:** A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2.

The reagent storage and mixing area will have MSDS sheets, eyewash station, emergency shower, cyanide antidote kits, and non-acidic dry fire extinguishers, all of which will be clearly marked with signs. Working in the cyanide mixing or storage area will require two workers who will wear the appropriate PPE and carry portable HCN gas monitors that will sound an alarm at 10 ppm. If any alarms are triggered, all workers will immediately evacuate the reagent storage and mixing area and process plant. The alarm will sound in the mixing facility and process plant. The source of the HCN gas detection will be indicated on a screen in the process plant control room. Video surveillance will confirm that all workers have left the area. If the alarm sounds in the process plant the building will be evacuated, including the control room, and personnel will report to the muster station.

An example MSDS for solid NaCN is provided in Appendix A, which will be updated once suppliers and specific hazardous materials have been selected and will be reviewed and updated at any point where alternative suppliers are selected during the life of the proposed project. At a minimum, paper copies of the MSDS for cyanide will be kept in the process plant control room, with the first aid equipment near the control room, in the reagent storage and mixing area, and in other areas where employees could be exposed to cyanide. The Health and Safety Department and the First-aid room will have paper copies as well. This will ensure that any person entering this area has immediate MSDS access.

5 TRAINING AND WORKER SAFETY

BMC will apply the following Cyanide Code principles related to training and worker safety:

- Protect workers' health and safety from exposure to cyanide;
- Protect communities and the environment through the development of emergency response strategies and capabilities; and
- Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

The Project will establish and maintain cyanide management and operating systems designed to protect the work force and surrounding environment. Safety is a top priority for BMC during the handling, storage, preparation, and use of cyanide throughout all Project phases. Standard operating procedures (SOPs) will be developed for the handling, storage, and use of NaCN in order to prevent cyanide releases in the workplace or to the environment, prevent exposure of workers and contractors, and minimize any impacts to the extent possible. These SOPs will be provided as Appendices in further revisions to this Plan and will be routinely reviewed and updated over the life of the project.

All employees and contractors will be accountable for their own safety and for the safety of their fellow workers while BMC is responsible for ensuring that employees and contractors are properly trained for the duties they will perform and have ready access to safety related PPE. Every employee and contractor must understand the standard operating procedures directly relevant to their position and must:

- Know what their responsibilities are;
- Have sufficient authority to carry them out;
- Have the required ability and competence (training or certification);
- Have training in the use of PPE required for the work being undertaken; and
- Clearly recognize that health and safety is an integral, full-time component of every job.

Work-specific training will include:

- Instructions on the use, access, and understanding of MSDS under a worker right-to-know program. This will include informing workers of properties and hazards associated with hazardous materials, safety requirements, and first aid and emergency response information. The training is to occur before a worker handles any hazardous material;
- Use of PPE appropriate for hazardous materials being used or stored, and for hazardous waste. This will include the proper care of PPE, and where replacement parts (e.g., filters) can be sourced on-site;
- The type of fire extinguisher appropriate for specific hazardous materials, where they are located, and how to operate them;

- Use and location of spill kits specific to hazardous materials; and
- Use and location of first aid kits.

Managers will be responsible for identifying training and competency requirements for workers under their supervision, and for ensuring that workers have the requisite competencies, skills, and training to carry out their assigned tasks. Process plant workers will be trained in the handling of cyanide, and will receive information on its potential health effects, how to recognize symptoms of cyanide exposure, and procedures to follow in the event of exposure (e.g.; use of the emergency shower). Specialized training will be provided for workers mixing cyanide in the reagent mixing area. Personnel will also be trained on the hazards cyanide poses to the environment, and which situations require response from the ERT.

The locations of emergency showers, eyewash stations, and emergency first-aid stations equipped with cyanide antidote kits will be prominently displayed at the reagent mixing area and in the process plant, and workers will be trained in their use. Additionally, training will cover the use of cyanide-specific PPE, first-aid procedures, and evacuation procedures in the event of high HCN gas alarm. Training incorporates taking direct action to control or contain a cyanide release, if it is safe to do so and only while wearing proper PPE (e.g., NaCN solution spilled on a dry floor in the process facilities).

The Project will design its facilities and develop SOPs that strictly limit worker exposure to NaCN. Workers will be required to comply with all applicable precautions and handling procedures for cyanide products. They will be expected to report any concerns to their supervisors, the Occupational Health and Safety Committee, or senior management. Suggestions by the work force for improvements will be reviewed and incorporated into SOPs as appropriate.

Workers will also be trained in spill response. If an employee is a first responder to a cyanide emergency, he or she will raise the alarm in calling Code 1 on the radio, which will lead to the mobilization of the ERT to respond. First responders will identify themselves, their location, and the nature of the emergency. If trained and if safe to do so, the first responder can provide first aid and/or contain the spill. It will be necessary to wear cyanide-specific PPE if responding to such an emergency.

Training requirements for the ERT in how to respond to cyanide incidents and the development of adequate and well-rehearsed responses will be included in the Emergency Response Plan. The ERT will receive training in the use of cyanide-specific PPE, such as self-contained breathing apparatus, and what actions to take to neutralize and decontaminate the workplace. The Emergency Response Plan will include procedures for maintaining emergency contacts and incident documentation.

Training records will be retained by Health and Safety Department, who will alert individuals and their departments when and what training is required for employees, including any refresher training for courses previously completed. Contractors will be responsible for keeping records for their employees working on-site.

5.1 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM

As a hazardous material, employees and contractors who transport and use cyanide will be required to complete Workplace Hazardous Materials Information System (WHMIS) training. Training will be provided by BMC's Health and Safety Department. Re-certification is required every three years.

Requirements by WHMIS for employers and contractors include the following:

- Ensure that employees are trained in handling hazardous materials;
- Establish communications between the supplier and the Project prior to hazardous materials being transported to the site;
- Provide proper safe and secure storage for hazardous materials and have WHMIS and MSDS placards prominently displayed on storage areas;
- Keep incompatible hazardous materials in separate storage locations;
- Ensure that storage areas have adequate ventilation and, if available, automatic monitoring equipment specific to the materials being stored (e.g., automatic hydrogen cyanide gas monitoring devices in areas where sodium cyanide is used in the workplace);
- Ensure that storage areas are regularly inspected with any deficiencies being immediately rectified;
- Provide appropriate spill kits and PPEs required for responses to spills of hazardous materials; and
- Provide emergency response equipment such as fire extinguishers, first aid kits, eye wash stations, and emergency showers.

5.2 TRANSPORTATION OF DANGEROUS GOODS

Employees responsible for receiving the cyanide shipment from the transporter will be trained in the transportation of dangerous goods following recommended guidance provided by Transport Canada:

- Definition of the nine classes of dangerous goods and their associated hazards;
- Shipping names, classes, UN numbers, and packing groups for the dangerous goods that are normally encountered on the job;
- Safety marks such as labels and placards that are used to identify the different classes of dangerous goods normally encountered on the job;
- Knowledge of the information that must be on a shipping document, including types of placards, labels, signs, numbers, and other safety marks, what they mean, and when and where to display them;
- The requirements regarding mixed loads and the need for segregation of incompatible dangerous goods;

- The proper selection and means of hazardous materials containment including safe practices on their loading and stowage; e.g., containers secured for transport will be upright, in good condition and not overfilled;
- What to do if the shipping documents, placards, labels, other safety marks, or means of containment seem inadequate or incorrect;
- What constitutes an accidental release and the reporting requirements if an accident happens;
- Proper use of all equipment used in the handling, offering for transport, and transportation of dangerous goods; and
- Loading, unloading, packing, or unpacking hazardous materials at the Mine Site.

BMC will train and certify employees are adequately trained to undertake their responsibilities in receiving cyanide from the transporter. Refresher training will be held annually for all trained employees and contractors.

6 EMERGENCY AND SPILL RESPONSE

Most major transportation providers in the Yukon are members of the Transportation Emergency Assistance Program (TEAP), a national emergency response network for managing a chemical transportation incident across Canada. One of the responsibilities of this organisation is the sharing of resources, consumables, equipment and personnel in the event of a spill. The transporter will be responsible for contacting TEAP in the event of a spill of materials being transported in their custody.

The Canadian Transport Emergency Centre (CANUTEC), a branch of Transport Canada, can also be contacted for 24 hr technical advice on Dangerous Goods, as needed. The CANUTEC Help Line for dangerous goods is **0 (613) 996-6666** (collect).

6.1 EMERGENCY RESPONSE

Emergency response will be detailed in the Project Health, Safety and Emergency Response Plan (HSERP). Generally, BMC has defined levels of emergency, depending on the severity or circumstances surrounding an incident or situation. Levels are defined by various criteria as outlined below:

- Level 1 (Low): A Level 1 incident is an emergency that can be dealt with by on site personnel and facilities;
- Level 2 (Serious): A Level 2 incident is an emergency that could be beyond the capabilities of the site operations and may require the activation of additional support or third-party contractors. For the specific circumstances of a cyanide related incident, additional support could include fire department services from the communities of Ross River and Watson Lake. Prior to commencing transportation of cyanide and use on site BMC will establish communications with such support providers to determine current capabilities in responding to a cyanide related incident if required. The incident may require reporting and/or limited assistance from YG emergency support services;
- Level 3 (Severe): A Level 3 incident is a highly serious situation with the possibility of developing into a crisis involving fatalities or multiple serious injuries. Level 3 emergencies may or may not easily escalate into a crisis. This situation will require the active involvement and/or assistance from YG emergency support services. The actual or potential consequences of a Level 3 emergency are such that the Company Senior Management needs to be immediately informed; and
- Crisis Management: An emergency may be so severe that it reaches a level 3 emergency, and could escalate to a situation involving fatalities or multiple serious injuries. In these rare occasions, a Crisis Management Plan (CMP) is required. The CMP will be put into place in conjunction with the HSERP.

The roles and responsibilities of key Project personnel in an emergency will be detailed in the HSERP. Roles and responsibilities will be outlined in two distinct categories:

- General Project Personnel; and

- Initial Emergency Responding Personnel.

Emergency response scenarios that may be developed in relation to sodium cyanide may include unanticipated events such as:

- Process plant or reagent mixing area HCN gas levels are above 10 ppm;
- Cyanide levels in the environment are above MMER or water use licence criteria; and
- Safety alarms are triggered in the process plant or reagent mixing area.

As described in Section 2 an Emergency Response Assistance Plan will be required to be provided by the production and transportation contractor to BMC. The Emergency Response Assistance Plan will outline strategies in the event of an emergency during the shipment of NaCN briquettes and is to include procedures and current home base contact information for notifying his/her home base, the Project site, regulatory agencies, medical facilities and potentially-affected communities. The trucks will carry health and safety equipment, and spill response supplies to be used in the event of an accident or loss of product. Safety is a paramount concern and the driver will have training in responding to spills while wearing appropriate PPE. A copy of the Emergency Response Assistance Plan will be provided to the ERT, should they need to respond to an incident involving a truck carrying cyanide.

The ERT will respond to emergencies at the Mine Site and Project-related incidents along the Access Road. The ERT will be staffed with site-based, qualified employees who are trained and receive the resources to respond to a range of emergencies including natural hazards, accidents, fires, and spills of hazardous materials.

Worker health and safety will be a priority when responding to emergencies. Site health care workers and strategic members of the ERT will be trained in how to administer medical oxygen and amyl nitrite antidote in instances of cyanide exposure that necessitate medical intervention. A cyanide antidote kit as well as medical oxygen and resuscitators will be located in the cyanide mixing facility as well as in the process plant near the control room in the event of any such occurrence. A cyanide antidote kit will also be located in the First Aid room. As part of emergency response planning, BMC will consult the Watson Lake Community Hospital and Whitehorse General Hospital, and their medical practitioners, as they will serve as back-up in the event of a serious cyanide incident.

6.2 SPILL RESPONSE

Any spill that occurs at the Project site will be reported through the internal reporting chain of command and will follow the procedures for assessment, prevention, containment and clean-up and reporting using BMC's Spill Report Form provided in Appendix B. All spills (whether reportable externally or not) will be reported as an incident by all Project personnel. Following the spill response, the designated personnel responsible for spill reporting will be required to document and review the spill using a Spill Reporting Form. The report requires inclusion of photos, a description of clean-up activities and subsequent actions, and identifies root causes and any required corrective and preventative actions.

NaCN spills greater than 5 kg or 5 liters, or a spill of any amount that enters Geona Creek, Finlayson Creek or any of their tributaries, must be reported to external authorities, following the requirements for a “reportable spill” under the Yukon Spill Regulations (OIC 1996/193), pursuant to the *Environment Act*, as follows:

1. The Environmental Lead will call the 24-hour Yukon Spill Report Line (envprot@gov.yk.ca or **1-867-667-7244**).
2. BMC’s designated Environmental Lead will ensure that the following information is collected before reporting to the Spill Report line:
 - Location of the spill or leak;
 - Time of spill or leak;
 - Severity of spill or leak;
 - Type of spill;
 - Product spilled;
 - Nearest watercourse;
 - Potential to enter surface water;
 - Fire hazard;
 - Hazard to life and limb, injuries;
 - Environmental effect expected, if any;
 - Equipment and clean-up consumables on hand; and
 - Actions to contain the spill.

Other external contacts are provided in Appendix C.

Sodium cyanide is a hazard class 6 division 1 chemical, as defined by the *Transportation of Dangerous Goods Act* (TDG). This means that NaCN is a “product or substance that is a poison as defined in sections 3.19(a) to (e) and 3.20(a) of the Federal Regulations”. Actions required for spill response are outlined in the MSDS (Appendix A), but special precautions include:

- PPE: Self containing breathing apparatus, full suit, chemical resistant gloves and safety goggles;
- Do not attempt to clean up a spill without proper training;
- Call the ERT;
- DO NOT ADD WATER: After cleaning up as much the spilled cyanide solution as possible, decontaminate the spill area using a small amount of caustic solution (i.e., 30 grams per 23 litres hypochlorite solution). This will keep the pH above 11.5 and suppress the formation of HCN gas; and

- Dispose of contaminated material off-site, or into the process waste stream.




Further details on spill response will be outlined in the Spill Contingency Plan.

7 REFERENCES

International Cyanide Management Institute (ICMI). 2018. The International Cyanide Management Code. Washington, D.C., USA. Available at: <http://www.cyanidecode.org>. Accessed April 2018.

APPENDIX A

SAMPLE MATERIAL SAFETY DATA SHEET – SODIUM CYANIDE

WHMIS 	Protective Clothing 	TDG Road / Rail 
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Section 1. Chemical product and company identification

Sodium cyanide (briquettes)

Code : Q02244
Synonym : Cyanide of sodium; Prussiate of soda.
Manufacturer : DUPONT CANADA
Supplier : QUADRA CHEMICALS LTD.
 370, boul. Joseph-Carrier
 Vaudreuil-Dorion QC J7V 5V5
 Tel: (450) 424-0161

 Burlington ON Tel: (905) 336-9133
 Delta BC Tel: (604) 940-2313
 Edmonton AB Tel: (780) 451-9222
 Calgary AB Tel: (403) 232-8130

Material uses : Ore leaching and flotation.

**TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK
IN CANADA - CALL 1-800-567-7455**

Section 2. Composition, Information on Ingredients

Name	CAS #	% by weight	Exposure limits
sodium cyanide	143-33-9	60-100	ACGIH TLV Skin CEIL: 5 mg/m ³ 8 hour(s). OSHA PEL Skin TWA: 5 mg/m ³ 8 hour(s). * AEL Du Pont: 5mg/m ³ , 15 min TWA, skin STEL: 10 ppm; 11 mg/m ³
other sodium salts	Not available.	1-5	Not available.

Consult local authorities for acceptable exposure limits.

Section 3. Hazards identification

Emergency overview : MAY BE FATAL IF INHALED, ABSORBED THROUGH SKIN OR EYES OR SWALLOWED. MAY CAUSE EYE BURNS, SKIN IRRITATION AND RASHES. MAY CAUSE RAPID RESPIRATIONS AND PULSE, REDNESS OF EYES, FLUSHED SKIN, WEAKNESS, HEADACHE, DIZZINESS, CONFUSION, NAUSEA AND VOMITING. THESE MAY BE FOLLOWED BY UNCONSCIOUSNESS, CONVULSIONS, CESSATION OF BREATHING, LOSS OF BLOOD PRESSURE, HEART BEAT IRREGULARITIES, DILATION OF PUPILS AND DEATH. THE LUNGS MAY FILL WITH LIQUID.

Routes of entry : Absorbed through skin, eyes, respiratory and gastrointestinal tract.

Potential acute health effects :

- Eyes** : Contact with sodium cyanide may cause eye irritation with discomfort, tearing or blurred vision. Prolonged exposure may cause eye corrosion with corneal or conjunctival ulceration.

Continued on next page

Skin	: Contact with sodium cyanide may cause skin irritation with discomfort or rash; strong solutions may cause skin burns or ulceration. Skin permeation may produce systemic toxicity.
Inhalation	: Inhalation, ingestion or skin contact of sodium cyanide may cause redness of the eyes, irritation of the throat, difficulty in breathing, palpitation, salivation, numbness, nausea, headache, weakness of arms and legs, giddiness, collapse and convulsions.
Ingestion	: Central nervous system stimulation followed by central nervous system depression may occur with hypoxic convulsions and death due to respiratory arrest.
Potential chronic health effects	: CARCINOGENIC EFFECTS Not available. MUTAGENIC EFFECTS Not available. TERATOGENIC EFFECTS Not available. DEVELOPMENTAL TOXICITY : Not available.
Medical conditions aggravated by overexposure	: Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures.
Over-exposure signs/symptoms	: Overexposure may lead to rapid respiration and pulse, flushing, cyanosis, acidosis, thyroid effects sometimes observed in individuals with nutritional deficiencies, symptoms associated with Parkinsonian syndrome, pulmonary edema and death. In the few cases of disturbance of vision or damage to the optic nerve or retina, the poisoning has been acute and severe or lethal. There are reports of increased incidence of insomnia, agitated sleep, tremors, dermatitis and nose bleed in electroplating workers.

See toxicological information (section 11)

Section 4. First aid measures

Eye Contact	: IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. Seek immediate medical attention.
Skin Contact	: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek immediate medical attention.
Inhalation	: Allow the victim to rest in a well ventilated area. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. Do not give mouth-to-mouth resuscitation if swallowed. To protect rescuer, use one way anti-reflux mask. Seek immediate medical attention.
Ingestion	: DO NOT induce vomiting. If the victim is conscious, give a little water or milk. NEVER give an unconscious person anything to ingest. If the victim is not breathing, perform artificial respiration. Do not give mouth-to-mouth resuscitation if swallowed. To protect rescuer, use one way anti-reflux mask. Seek immediate medical attention.
Notes to Physician	: First aid treatment uses oxygen and amyl nitrite and can be given by first responder before medical help arrives. Medical treatment is given if the patient does not respond to oxygen and amyl nitrite. Medical treatment is a more aggressive treatment requiring intravenous injections of sodium nitrite and sodium thiosulphate and must be administered by qualified medical personnel. It provides a larger quantity of antidote which helps eliminate cyanide from the body. When antidotal treatment is necessary, it should be started immediately. In most cases, cyanide poisoning causes a deceptively healthy pink to red skin colour. However, if a physical injury or lack of oxygen is involved, the skin colour may be bluish. Reddening of the eyes and pupil dilation are also symptoms of cyanide poisoning. Cyanosis tends to be associated with severe cyanide poisonings whereas red coloration of the skin is more common in industrial accidents that involve less cyanide. IN CASE OF CYANIDE POISONING, START FIRST AID TREATMENT IMMEDIATELY. MEDICAL TREATMENT PROCEDURE A. Sodium nitrite: Adult - 10ml of 3% solution (300mg). Draw solution from the ampoule and inject slowly over 4-5 minutes (2 to 2.5ml/minute). As soon as practical, monitor blood pressure and continue checking pulse. Slow the rate of injection if hypotension occurs. B. Sodium thiosulphate: Adult - 50ml of 25% solution (12.5 grams). Follow sodium nitrite with sodium thiosulphate injected at a rate of 2.5 ml/minute (10-20minutes). The total time for injection of these initial doses of both components at the recommended rates is lengthy, approximately 20-25 minutes. Consider the body weight and condition of the patient when treating a cyanide exposed patient with sodium nitrite. Both amyl nitrite and sodium nitrite produce methemoglobin, which reduces the oxygen carrying capacity of the blood. Methemoglobinemia is potentially harmful when methemoglobin levels exceed 20-30%. If symptoms persist or recur after the initial treatment, repeat the antidote at one half the original doses one hour after the original administration. Monitor methemoglobin levels when practical in every patient treated with the intravenous antidote. AVOID OVER-TREATMENT The above sodium nitrite injection discussed in the Medical treatment procedure section is about one-

Continued on next page

third the lethal dose, so care should be taken to avoid excessive use. It is not essential that full quantities of antidote be given just because treatment was started. Should injection be stopped for any reason, keep track of the amount administered in case treatment needs to be restarted.

ANTIDOTAL EFFECTS

Nitrites can produce hypotension through peripheral vasodilatation. Methemoglobin formation, although considered a therapeutic effect, may cause symptoms if levels exceed 20-30%. Recommended intravenous doses of sodium nitrite discussed in the Medical treatment procedure section usually produce methemoglobin levels under 20%. Headache, nausea, vomiting and syncope (fainting) may follow nitrite administration and syncope may occur if the patient is not lying down.

RECOVERY AND DISPOSITION

For most accidental poisonings, patients can be revived in a few minutes using oxygen and amyl nitrite with complete recovery within a few hours

If necessary, the patient should be monitored for 24-48 hours. Any patient whose symptoms require the use of IV antidote should be considered for admittance to an intensive care unit.

Observe for return of symptoms. Monitor methemoglobin levels, blood pH and oxygenation through arterial blood gas analysis. Calculate anion gap from serum electrolytes. Cyanide poisoning causes lactate accumulation and an anion gap metabolic acidosis.

Delayed neurotoxic effects are not expected consequences of cyanide exposure although neurotoxic effects may occur if hypoxia (oxygen deficiency) was prolonged or occurred following massive cyanide exposure.

In the presence of smoke inhalation that occur during fires, with holding amyl nitrite or sodium nitrite administration should be considered because of the potential for high carboxyhemoglobin levels. However, administration of oxygen and possibly sodium thiosulphate should be continued.

NOTES TO FIRST AID RESPONDER TRAINED FOR USE OF OXYGEN AND AMYL NITRITE

All persons with the potential for cyanide poisoning should be trained to provide immediate First aid using oxygen and amyl nitrite. Always have on hand the materials listed below in the First aid and Medical treatment sections. Identification of community hospital resources and emergency medical squads in order to equip and train them on handling of cyanide emergencies essential.

FIRST AID SUPPLIES

Adequate First aid supplies for cyanide poisoning should be conveniently placed throughout the cyanide areas and should be immediately accessible at all times, but secured against tampering or theft. Supplies should be routinely inspected by people who would use them in an emergency. The total number of each item listed below should be adequate to handle the largest number of exposure cases reasonably anticipated, taking into account that some supplies may be wasted, destroyed or inaccessible in the emergency.

1. Oxygen resuscitators - Any positive pressure resuscitator capable of giving oxygen in conjunction with amyl nitrite can be used.

2. Amyl nitrite ampoules (antidote) - One box of one dozen ampoules per station is satisfactory. Locate stations throughout the cyanide area.

Caution: Amyl nitrite is not stable and must be replaced every 1-2 years (depending on storage conditions). Store in the original dated box away from heat and freezing temperatures.

3. A set of cyanide first aid instructions should be located at each amyl nitrite storage location. Workers should be fully trained since in a real emergency there will be insufficient time to "read the book".

Amyl nitrite notes:

- Amyl nitrite is highly volatile and flammable; do not smoke or use around a source of ignition.
- If treating a patient in a windy or drafty area, provide something - a rag, shirt, wall, drum, etc., to prevent the amyl nitrite vapours from being blown away. Keep the ampoule upwind from the nose. The objective is to get amyl nitrite into the patient's lungs.
- Rescuers should avoid amyl nitrite inhalation to avoid becoming dizzy and losing competence.
- Lay the patient down. Since amyl nitrite dilates blood vessels and lowers blood pressure, laying the patient down will help prevent unconsciousness.
- Do not overuse. Monitor the patient for shock which would indicate excessive use.
- Review and adhere to proper storage, inspection and replacement requirements given above.

FIRST AID PROCEDURE

The exposed person should be removed from the contaminated area, contaminated clothing removed and the individual washed off. The person providing first aid is subject to exposure if the affected person's clothing is wetted with cyanide.

As soon as possible, even while clothing is being removed or washing is taking place, First aid should be started.

- If no symptoms are evident, no treatment is necessary; decontaminate patient.
- If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen.
- If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a resuscitator.

To give amyl nitrite, break an ampoule in a gauze pad and insert into lip of the resuscitator mask for 15 seconds, then take away for fifteen seconds. Repeat 5-6 times. If necessary, use a fresh ampoule every

3 minutes until the patient regains consciousness (usually 1-4 ampoules). Administer oxygen continuously. Guard against the ampoule entering the patient's mouth.

4. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure resuscitator (artificial respiration).

Administer amyl nitrite and continue to give oxygen simultaneously to aid recovery. If massive exposure occurred, consider keeping the first one or two ampoules in the lip of resuscitator mask continuously. Guard against the ampoule entering the patient's mouth.

MEDICAL TREATMENT

THE FIRST AID GIVEN PROMPTLY IS USUALLY THE ONLY TREATMENT NEEDED FOR TYPICAL INDUSTRIAL CYANIDE POISONING. LARGER CYANIDE POISONINGS INCREASE THE NEED FOR MEDICAL TREATMENT.

Do not over-react. Although prompt action is essential when poisoning has occurred, a lucid, conscious person who can communicate may not have significant cyanide poisoning and Medical treatment will rarely be necessary. "Treat what you see" is a good rule of thumb. Mildly symptomatic patients who remain alert may be managed by supportive care only.

The half-life of cyanide in the body is about 20-90 minutes. In diagnosis and monitoring of patients, the critical period for treatment is short. Normally the effects from cyanide poisoning occur in the first few minutes and will indicate the degree of poisoning.

"Preventive" use of cyanide antidote in the absence of impaired consciousness is not normally warranted. Keep the patient calm by assurance over the next 30 minutes and closely monitor the patient's condition. If skin contact with cyanide has been prolonged and/or extensive cyanide has been ingested, watch the individual closely for at least 30 minutes to assure there are no effects from delayed absorption of cyanide into the blood stream.

Consider assuring intravenous access in cases where significant toxicity is possible. Establishment of IV access with normal saline, Ringer's lactate or other available IV fluid will facilitate administration of the antidote if necessary.

MEDICAL TREATMENT KITS

Medical treatment kits should be conveniently located for easy access. Materials for intravenous injection are intended for use only by a physician or fully qualified medical personnel. The location of kits should be carefully planned as part of the emergency program. Suggested locations for kits include:

- in or near the cyanide area;
- plant medical station;
- guard house entrance;
- local hospital;
- doctor's office and residence.

Medical treatment kits should contain the following:

1. One box containing one doze (12) amyl nitrite ampoules.
2. Two sterile ampoules of sodium nitrite solution (10 ml of 3% solution in each).
3. Two sterile ampoules of sodium thiosulphate solution (50 ml of a 25% solution in each).
4. One 10 ml sterile syringe. One 50 ml sterile syringe. Two sterile intravenous needles. One tourniquet.
5. One dozen gauze pads.
6. Latex gloves.
7. A "biohazard" bag for disposal of bloody/ contaminated equipment.
8. A set of cyanide instructions on first aid and medical treatment.

Note: Amyl nitrite ampoules and Medical treatment supplies can be purchased through local pharmacies with a physician's prescription.

Section 5. Fire fighting measures

Flammability of the product	: Non-flammable.
Auto-ignition Temperature	: Not applicable.
Flash Points	: Not applicable.
Flammable limits	: Not applicable.
Products of combustion	: Not applicable.
Fire hazards in presence of various substances	: Not applicable.
Explosion hazards in presence of various substances	: Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire fighting media and instructions	: Use water spray or fog. Do not use carbon dioxide which reacts with sodium cyanide to produce hydrogen cyanide in the presence of moisture. Wear NIOSH approved self-contained breathing apparatus (SCBA) when either in confined areas or exposed to combustion products.

Continued on next page

Section 6. Accidental release measures

- Spill or leak : Use appropriate tools to put the spilled material in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to federal, provincial and municipal environmental control regulations.

Section 7. Handling and storage

- Handling** : Follow routine safe handling procedures. Avoid dust generation. Avoid all contact with skin and eyes. Emergency pre-planning and training required. Always handle under ventilation with exhaust system. Always have cyanide antidote readily available if the product is used at remote facilities that would not receive rapid fire and emergency assistance.
- Storage** : Keep container tightly closed. Keep in a cool, dry and well ventilated place. Avoid dust generation. Store away from incompatible materials.

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective threshold limit value. Ensure that eye stations and safety showers are proximal to the work-station location.
- Personal protection**
- Eyes** : Splash goggles or faceshield.
 - Body** : Rubber full suit and apron.
 - Respiratory** : If user operations generate dust, fume, mist or if workplace contaminant level is above threshold limit, ensure to use a MSHA/NIOSH approved respirator or equivalent.
 - Hands** : Butyl rubber or neoprene gloves.
 - Feet** : Rubber boots.

Section 9. Physical and chemical properties

- Physical State and Appearance** : Solid. (Granular; briquettes.)
- Color** : White.
- Odor** : Odourless.
Solid cyanide has no odour, but it can have a slight ammonia and/or hydrogen cyanide odour if damp.
- pH** : 11 to 12 (Conc. (% w/w): 5 - 25)
- Boiling/condensation point** : 1496°C (2724.8°F) @ 760 mmHg
- Melting/freezing point** : 564°C (1047.2°F)
- Specific Gravity** : 1.6 (Water = 1)
- Vapor pressure** : Negligible.
- Solubility** : Soluble in cold water: 37% @ 20°C.

Section 10. Stability and reactivity

- Stability and Reactivity** : The product is stable.
- Conditions of instability** : No additional remark.
- Incompatibility with various substances** : Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids. Reacts violently with strong oxidizing agents when heated. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas.
- Hazardous Decomposition Products** : Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide and ammonia gases.
- Hazardous polymerization** : Will not occur.

Continued on next page

Section 11. Toxicological information

- Toxicity data** : Acute oral toxicity (LD50): 7 mg/kg (Rat) (Calculated value for the mixture) Oral LD 50: 15mg/Kg [rat], (sodium cyanide). Dermal LD50: 11.28-14.63 mg/Kg [rabbit] (sodium cyanide)
Acute dermal toxicity (LD50): 13 mg/kg (Rat) (Calculated value for the mixture).
Acute eye toxicity (LD50) (Rat) = 4,47 mg/kg (sodium cyanide)
- Chronic effects on humans** : No additional information.
- Other toxic effects on humans** : No additional information.
- Remarks on toxicity to animals** : Administration of sodium cyanide to rats, cats or dogs by the intravenous or intraperitoneal routes resulted in rapid respiration, confusion, unconsciousness, vomiting, decreased blood pressure, cardiac rate changes, seizures and respiratory failure.
Systemic toxicity and death is possible from contamination of the eye (rabbits).
Sodium cyanide applied to the skin of rabbits produced tremors, retrocolic spasms, convulsions, abnormal breathing patterns and prostration.
Repeated administration of cassava diets containing unspecified cyanide ion caused decreased thyroid activity and kidney changes. Long-term administration of 0.5; 1.0 or 2.0 mg/kg/day to dogs produced unspecified acute intoxication symptoms and increased numbers of red blood cells and decreased proteins were observed at doses greater than 1.0 mg/kg/day. Central nervous system changes occurred in all treated dogs.

Section 12. Ecological information

- Ecotoxicity data** : Ecotoxicity in water: 0.43 to 0.66 mg/l [LC50], 96 hours [Fish (Fathead minnow.)]. 0.046 to 0.075 mg/l [LC50], 96 hours [Fish (Rainbow trout.)]. 0.28 mg/l [LC50], 96 hours [Fish (Bluegill sunfish.)] [sodium cyanide].
- Remarks on the products of biodegradation** : No additional remark.

Section 13. Disposal considerations

- Waste information** : Waste must be disposed of in accordance with federal, provincial and municipal environmental control regulations.
- Waste stream** : Avoid entry of product into the sewage system or water streams.

Consult your local or regional authorities.

Section 14. Transport information

Regulatory Information	Shipping name and Class	UN number	Packing group
TDG Classification	SODIUM CYANIDE Class 6.1	1689	I

Section 15. Regulatory information

- WHMIS (Canada)** : MAY BE FATAL IF INHALED, ABSORBED THROUGH SKIN OR EYES OR SWALLOWED. MAY CAUSE EYE BURNS, SKIN IRRITATION AND RASHES.
CLASS B-6: Reactive and very flammable material.
Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class E: Corrosive solid.
- DSL (CEPA)** : CEPA DSL: All ingredients are listed or exempted.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations.

Continued on next page

Section 16. Other information

- References : Canadian Guide of the Law and Regulations of the Transportation of the Dangerous Goods. Controlled products regulations. Manufacturer's Material Safety Data Sheet.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
- Other special considerations : * AEL is DuPont's (the manufacturer) Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.
- Regulatory Affairs Department : (450) 424-0161

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

PRODUCT NAME: CYANOBRIK® SODIUM CYANIDE

Site: MEMPHIS

PRODUCT NUMBER: 1220

SBU: DCSE
Business: CYANIDES

Revision: 2

Date Issued: 2003-02-26
Date Superseded: 2003-01-24

Similar Names: Cyanide of Sodium
Prussiate of Soda

SALES SPECIFICATIONS:

<u>Property</u>	<u>Units</u>	--- LIMITS ---		<u>Typical</u> <u>Analysis</u>	<u>Test Method</u>
		<u>Min.</u>	<u>Max.</u>		
Sodium Cyanide	(%)	98.0		99	C6350.445.01.ME
Sodium Hydroxide	(%)	0.06	0.5	0.3	C6350.005.01.ME
Sodium Formate	(%)		0.8	0.3	C6350.575.01.ME
H2O	(%)		0.2	0.05	C6350.570.01.ME
Color				White	C6350.065.01.ME
Sodium Carbonate	(%)		0.9	0.4	C6350.005.01.ME

APPEARANCE: Briquettes with dimensions of approximately 1-3/8 x 1-3/8 x 0.5 in. (3.5 x 3.5 x 1.3 cm.) weighing about 18 grams

OTHER INFORMATION:

DOT Hazard Classification: 6.1, DOT/IMO label Toxic, UN number 1689

PHYSICAL DESCRIPTION:

<u>Property</u>	<u>Typical Value</u>	<u>Units</u>
Formula Weight	49.007	
Melting Point, C (F)	562 (1044)	
Boiling Point @ 760mm Hg, C (F)	1530 (2786)	
Specific Gravity (solid) @ 25C (77F)	1.60	
(liquid) @ 850C (1560F)	1.19	
Solubility in Water, g/100g water		
@ -20C (-4F)	35.4	
@ 20C (68F)	58.3	
Sodium Chloride (%)	0.01	
Sulfides as S (ppm)	<1.0	

PRODUCT NAME: CYANOBRIK® SODIUM CYANIDE

Site: MEMPHIS

PRODUCT NUMBER: 1220

SBU: DCSE
Business: CYANIDES

Revision: 2

MANUFACTURING CONTROL SPECIFICATIONS:

<u>Property</u>	<u>Units</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Typical Analysis</u>	<u>Test Method</u>
Briquette flow		Free Flowing		Pass	Visual

APPROVALS:

Submitted by: J.Seymour

R&D Division: J.Allison

Product Division: D.Elliott

Tech Services: D. Whitworth

AUTHORIZED

Business Division: N/A

APPENDIX B
SPILL REPORTING FORM

Spill Reporting Form

1. Type: (check) Oil ___ Gasoline ___ Diesel ___ Contaminated Soil ___
Other (name) _____
2. Source: _____
3. Severity: (check) Minor 100-400 litres ___ Major 400-1,000 litres ___ Emergency more than 1,000 litres ___
4. Date of Incident: _____ Time: _____
5. General mine site location: _____
6. Specifics of location: (e.g., near airstrip) _____
7. Cause of incident (e.g.: machine failure): _____
8. Reason: (e.g.: earthquake): _____
9. Weather conditions: Temperature ___ Wind Direction/Speed ___ Precipitation ___
10. Hazards to human life or health: _____
11. Expected environmental effects: _____
12. Nearest surface water with approximate distance to spill: _____
13. Potential to enter surface water: _____
14. Fish Kill: Yes ___ No ___ Bird Kill: Yes ___ No ___
15. Fire hazard: _____
16. Threat to drinking water: _____
17. Who to contact at the scene: _____
18. Company: _____ Phone: _____
19. General Comments: _____
20. How to prevent recurrence: _____
21. Action taken to date: Containment: _____
22. Clean up: _____
23. Photos Attached: Yes ___ No ___

Reported by:

Name: _____ Dept.: _____ Phone: _____

Reviewed by:

Name: _____ Dept.: _____ Phone: _____

APPENDIX C
TELEPHONE CONTACTS

BMC Contacts		
Resource	Email	Contact Number
Site Supervisor (BMC)	To be determined prior to construction	To be determined prior to construction
KZK Environmental Manager, Kelli Bergh	kellib@bmcmminerals.com	778-233-7058
Cyanide Emergency Response		
Resource	Email	Contact Number
Chemtrec		1-800-424-9300
Dupont Emergency Response		1-800-444-2043
Memphis NaCN Plant (CYANIDE HOTLINE)		1-901-357-1546
Dupont Medical		1-800-441-3637
Dupont Product Information		1-800-441-7515
External Reporting and Contacts for Submission of Spill Reports		
Resource	Email	Contact Number
Yukon Territorial 24-hour Emergency Spill Response Number (to report a spill)	environment.yukon@gov.yk.ca	(867) 667-7244
CANUTEC - Dangerous Goods Help (for technical advice)		Collect 0-(613) 996-6666
Kaska First Nation		(250) 779-3181
Police (Ross River)		(867) 969-5555
Fire Department (Ross River)		(867) 969-2222
Ambulance (Ross River)		(867) 969-4444
Hospital – Whitehorse		(867) 667-8700
Fire Department – Whitehorse		867 668-8699 or 867 668-2462
Police – Whitehorse		867 667-5555
Government of Yukon Fire Hotline		1-888-798-FIRE(3473)
Government of Yukon Department of Environment, Water Resources Branch	water.resources@gov.yk.ca	867 667-3171
Government of Yukon Environmental Protection Branch	environment.yukon@gov.yk.ca	867 667-5652
Government of Yukon Environmental Programs Branch Monitoring and Inspections Section	envprot@gov.yk.ca	(867) 667-5683