

APPENDIX 22C: CYANIDE MANAGEMENT PLAN

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APPENDIX 22B - CYANIDE MANAGEMENT PLAN

1 – INTRODUCTION

Oxide gold ore from the Casino Project will be processed by stacking crushed ore in lifts onto a heap leach pile and irrigating the pile with a cyanide solution (barren process solution). The heap leach pad will consist of liners and a low-permeability soil overliner. Ore will be layered in eight lifts onto the pad and the barren process solution will be applied to ore lots with drip emitters to minimize evaporation losses. Pregnant solution from the ore heap will be collected in a network of pipes placed in the overliner material and directed to an in-heap collection area. The pregnant solution will then be pumped to the carbon-in-column (CIC) / Sulphidization, Acidification, Recycling and Thickening (SART) circuit for recovery of gold and copper. When the last process leach cycle is completed on the last ore lift, the ore heap will be rinsed with fresh water to recover the remaining gold and rinse the residue. Following operations, the heap leachate solution will be detoxified using a SO₂ / Air cyanide destruction process.

Prior to the start of operation, a comprehensive Cyanide Management Plan for the Casino Project will be developed to ensure worker safety and to prevent release of cyanide to the environment. The following subsections provide a conceptual Cyanide Management Plan, outlining the information and the level of detail that will be provided in the final plan. The plan will include all applicable mitigation and management measures developed through the environmental assessment process and committed to by Casino Mining Corporation, as well as any additional conditions specified in the Water Licence required for operation.

The Cyanide Management Plan will be developed in consideration of the principles and standards of practice of the International Cyanide Management Code (Cyanide Code). The principles and standards of practice related to the following components, activities and management measures are relevant to the Casino Project:

- Transportation
- Handling and storage
- Process solutions and waste streams
- Decommissioning
- Worker safety
- Emergency response and training
- Public consultation.

Casino Mining Corporation is committed to following the Cyanide Code Principles and implementing its Standards of Practice through all phases of the Casino Project.

The Cyanide Management Plan will be integrated with other relevant Environmental Management Plans (e.g., Emergency Response Plan, Spill Contingency Plan) to ensure that worker and public health and safety and the environment are protected.

2 – CYANIDE TRANSPORTATION

To ensure the protection of communities and the environment during transport of cyanide to the Casino 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.

Casino Mining Corporation will require that contractors retained for delivery of cyanide to the Project will develop and implement a Cyanide Transportation Plan that is consistent with the Cyanide Code, as well as the Casino Cyanide Management Plan and component plans of the Environmental Management Plan.

The following industry best management practices will be described and implemented:

- Vehicles used for transportation of the cyanide and all containers and packaging comply with all applicable prescribed safety standards and display all applicable prescribed safety marks in accordance with the *Dangerous Goods Transportation Act*.
- Chain of custody documentation (including Material Safety Data Sheets) to track inventory and movement of cyanide.
- Methods to minimize the potential for contact of solid cyanide with water (e.g., covered trucks, sealed containers).
- Use of escort vehicles or convoys for cyanide shipments as necessary (e.g., inclement weather, change in road conditions).
- Regular maintenance of transportation equipment including containers, vehicles, loading and unloading machinery and storage systems.
- Training of all personnel operating cyanide handling and transport equipment.
- Emergency response plans for potential cyanide releases during transportation including:
 - Designate appropriate response personnel and commit necessary resources for emergency response.
 - Emergency response training of appropriate personnel.
 - Descriptions of the specific emergency response duties and personnel responsibilities.
 - A detailed list of all emergency response equipment available during transport or along the transportation route.
 - A detailed list of all emergency response and personal protective equipment during transport including self-contained breathing apparatus and oxygen gas.
 - Initial and periodic refresher training in emergency response procedures including implementation of the Emergency Response Plan and Spill Contingency Plan.
 - Develop procedures for internal and external emergency notification and reporting.
 - Periodically evaluate response procedures and capabilities and revise them as needed.

The final Cyanide Transportation Plan developed by the contractor responsible for transportation of cyanide to the mine site will include a risk assessment of the transportation route that will consider water crossings, population centres, road characteristics, weather characteristics, and public infrastructure.

3 – CYANIDE HANDLING, STORAGE, AND USE

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

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

The final Cyanide Management Plan will be developed in accordance with the following Cyanide Code standards of practice:

- Design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices and quality control and quality assurance procedures, spill prevention and spill containment measures
- Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.
- Implement measures to protect birds and other wildlife from adverse effects of cyanide process solutions.
- Implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.
- Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.
- Provide spill prevention or containment measures for process tanks and pipelines.

Delivery and unloading of cyanide on site will take place in a covered, concrete-bunded area located away from general work areas and incompatible reagents. Portable pumps will be provided within the processing area for the pumping of spills within the bunded areas back to the storage tanks or emergency holding tanks. Ventilation will be provided to prevent build-up of hydrogen cyanide gas in storage and mixing areas.

The unloading and storage area will be designed to allow safe manoeuvring of forklifts, trucks, and trailers,

Sodium cyanide containers will be offloaded to concrete pads with concrete curbing that provide a minimum of 110% containment of the largest sized container.

Unloading and storage area design drawings will be prepared for construction of the facilities as required by the Yukon Water Use License 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.
- Waste disposal methods (empty cyanide containers).

4 – DECOMMISSIONING

The Cyanide Code principle related to decommissioning of the Casino Project is to develop and implement decommissioning plans for cyanide facilities to protect communities and the environment. A comprehensive closure and reclamation plan will be prepared for the Casino Project to meet all Yukon Government regulatory, licensing, and policy requirements. Reclamation and closure activities selected will be based upon best available technology that is technically and economically viable. The closure objective for the heap leach facility will be to ensure the long-term physical and chemical stability of the decommissioned heap leach pile. Decommissioning and closure activities for the cyanide facilities will include:

- Rinsing and drain-down of the ore on the heap leach pile, and cyanide destruction;
- Grading, covering, and revegetation of final heap slopes to provide adequate drainage and erosion protection from surface runoff;
- Removal of the geosynthetic liners from the overflow spill way and the events pond; and
- Removal of pregnant solution, events pond pumps, and pipeworks.

The Cyanide Code standards of practice related to decommissioning are:

- Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.
- Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.

5 – WORKER SAFETY AND EMERGENCY RESPONSE

The following Cyanide Code principles are addressed in this section:

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

This section of the Cyanide Management Plan will be implemented in conjunction with the Occupational Health and Safety Management Plan and the Emergency Response Plan. The following standards of practice will be implemented to meet Cyanide Code principles:

- Identify potential cyanide exposure scenarios and measures necessary to eliminate, reduce and control them and minimize worker exposure. The scenarios will include but not be limited to unloading, mixing, entry into confined spaces and equipment decontamination.
- Prepare detailed emergency response plans for potential cyanide releases. The plans will outline potential scenarios associated with cyanide and specific response actions such as clearing site personnel, and advising the village of Carmacks as necessary.
- Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.
- Involve site personnel and stakeholders in the planning process.
- Periodically evaluate response procedures and capabilities and revise them as needed.
- Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.
- Train workers to understand the hazards associated with cyanide use.
- Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide, including use of cyanide antidotes and first aid measures.
- Designate appropriate personnel and commit necessary equipment and resources for emergency response.
- Develop procedures for internal and external emergency notification and reporting.

6 – CYANIDE SPECIFIC MONITORING AND REPORTING

This section of the Cyanide Management Plan will be implemented in conjunction with applicable operational monitoring plans as well as the Water Monitoring Plan and the Wildlife Monitoring Plan. The standards of practice of the Cyanide Code relevant to this section are:

- Incorporate into response plans monitoring elements and remediation measures that account for the additional hazards of using cyanide treatment chemicals.
- Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.
- Initiate dialogue describing cyanide management procedures and responsively address identified concerns.

Make appropriate operational and environmental monitoring information regarding cyanide available to stakeholders.

The final environmental monitoring program will include schedules, locations, and techniques for cyanide sampling. Analysis of samples will be conducted at an accredited laboratory. Quality Assurance and Quality Control (QA/QC) procedures will be documented for both field and laboratory programs. The plan will outline the secure data management system that will be employed.

Storage areas, tanks, pipelines, pumps and valves will be inspected regularly for signs of leakage, presence of solution outside of the tanks in the bunded areas, and container integrity. Any recommendations for maintenance or repair will be noted and records documenting the inspection and corrective measures will be kept.

Results will be reported in accordance with conditions specified in all applicable licences, authorizations and permits. The monitoring program will include a checking and corrective action component, which will include review of monitoring results and subsequent assessment of the Project's performance in relation to environmental objectives.