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A.21 – ACCIDENTS AND MALFUNCTIONS

A.21.1 INTRODUCTION

Section 21 of the Proposal for the Casino Project (the Project) presented an assessment of potential environmental or socio-economic effects that could result from accidents or malfunctions of the Project. The intent of the Proposal was to identify potential hazards associated with the Project, assess the associated risks, and identify risk reduction strategies (mitigation measures) to reduce the risks to an acceptable level on a continuous basis.

The Proposal assessed credible accidents and malfunction scenarios with the potential for moderate to major effects or consequences; the analysis of risk included the evaluation of the likelihood of occurrence of a credible incident, and the consequences should the incident occur. A qualitative risk assessment was used with descriptive terms to identify broad likelihoods and consequences of events; the accidents and malfunctions were illustrated and ranked using a risk matrix.

On January 27, 2015, the Executive Committee requested that Casino Mining Corporation (CMC) provide supplementary information to the proposed Casino Project (YESAB Project No. 2014-0002) to enable the Executive Committee to commence Screening. The Executive Committee considered received comments from various First Nations, Decision Bodies and regulators on the adequacy of the Project Proposal in the preparation of the Adequacy Review Report (ARR). Casino Mining Corporation is providing this Supplementary Information Report (SIR) to comply with the Executive Committee's Adequacy Review Report; CMC anticipates that the information in the SIR and Proposal, when considered together, is adequate to commence Screening.

The Executive Committee has 19 requests related to information presented in Section 21 Accidents and Malfunctions of the Proposal submitted on January 3, 2014. These requests are outlined in Table A.21.1-1. Some responses require detailed technical information, data, and figures. Where necessary, this additional supporting information is provided as appendices to the SIR.

Table A.21.1-1 Requests for Supplementary Information Related to Accidents and Malfunctions

Request #	Request for Supplementary Information	Response
R417	A revision of the section on accidents and malfunctions to address worker and public health and safety.	Section A.21.2.1.1 Appendix A.22B Spill Contingency Management Plan
R418	Clarification of the procedures that will be established in the event of a Level II Emergency Event, as defined in the conceptual Emergency Response Plan, and how these procedures rely on existing infrastructure and services.	Section A.21.3.1.1 Appendix A.22B Spill Contingency Management Plan
R419	For accidents on the Freegold Road, a description of how emergency services will be coordinated, and where these services will come from.	Section A.21.3.1.2 Appendix A.22E Road Use Plan

R420	A description of any discussions between CMC and protective and emergency services regarding increases in traffic and therefore and increase in accidents on the Freegold Road, Alaska Highway or Klondike Highway?	Section A.21.3.1.3 Appendix A.22A Waste and Hazardous Materials Management Plan Appendix A.22B Spill Contingency Management Plan Appendix A.22G LNG Management Plan
R421	Details regarding on-site personnel, equipment, and services that are provided based on anticipated requirements.	Section A.21.3.1.4
R422	Describe and outline how would the mine site be evacuated in different seasons. Details should include: a. length of time an evacuation would require; and b. logistics for transportation.	Section A.21.3.2.1
R423	The rationale for two hours, or 682 m^3, as the minimum capacity for water storage for on- site firefighting capacity.	Section A.21.4.1.1 Appendix A.4M Processing Flow Sheets
R424	Confirmation of where off-site emergency fire services for the Project will come from.	Section A.21.4.1.2
R425	A description of the human element in fire suppression and equipment available including: a. the level of training will be available to workers in fire suppression; b. a description of firefighting infrastructure will be on-site; and c. a description of any equipment available for first responders.	Section A.21.4.1.3
R426	An elaboration on the need or absence of need for non-water jet firefighting methods.	Section A.21.4.1.4
R427	Description of the consideration of fire at the cyanide, LNG, or explosives facilities.	Section A.21.4.1.5 Appendix A. 22G LNG Management Plan
R428	A description of any plans to train and familiarize first responders with the Project and associated hazards, infrastructure, and layout.	Section A.21.4.1.6
R431	A description of any medical infrastructure that will be in place on-site regarding medical emergencies, and the depth of nursing, pharmaceutical, and first aid services that CMC forecasts as being available on-site.	Section A.21.5.1.1

R432	Details on the capacity to provide medical treatment planned in event of a potential delay to emergency response. Please describe this in terms of both the ability to provide emergency medical care for multiple casualties concurrently as well as in terms of overall duration and level of care.	Section A.21.5.1.2
R433	Considering the remote nature of the Freegold Road, a description of medical and communication capacity along the Freegold Road and its extension including the need or absence of need for any helipads.	Section A.21.5.1.3
R434	A description of how a destination medical facility will be chosen and the threshold for medevac.	Section A.21.5.1.4
R446	Describe how emergency and non-emergency services in Carmacks were factored into Project plans and design. Consideration should be given to health, law enforcement, conservation, and other government services.	Section A.21.6.1.1
R447	A detailed characterization of potential major mine infrastructure failures and proposed response measures to these events.	Section A.21.7.1.1
R448	An updated discussion regarding the likelihood and consequence of a TMF embankment failure considering the entire lifetime of the facility (i.e. in perpetuity) in light of updated site condition characterization and dam break/inundation analysis as outlined in other sections of the Adequacy Review Report.	Section A.21.7.1.2

Notes:

1. Request # refers to the assigned identification number in the YESAB Adequacy Review Report of January 27, 2015 Prepared by the Executive Committee of the Yukon Environmental and Socio-economic Assessment Board.
2. Response refers to the location of CMC's response to the YESAB request for supplementary information.

A.21.2 ACCIDENTS AND MALFUNCTIONS METHODOLOGY

A.21.2.1.1 R417

R417. A revision of the section on accidents and malfunctions to address worker and public health and safety.

As discussed in Section A.5, worker health and safety is protected by a legally binding government requirement that obliges mandatory compliance. While Section 42 of YESSA requires a determination of the significance of any environmental or socio-economic effects resulting from accidents or malfunctions, effects on human health and safety are not acceptable outcomes of any Project activities, and plans and procedures must be in place to avoid any such effects. Worker health and safety is protected under the *Occupational Health and Safety Act* and related regulations, and the *Quartz Mining Act* also enables the regulator to shut down the mine should the mining works be deemed a danger to public or employee safety.

All Project related activities will be conducted in a manner that minimizes risk to worker health and safety through training, awareness, and continuous improvement. Worker health and safety is the primary objective of the detailed Occupational Health and Safety Plan that will be developed by CMC and submitted to the Yukon Government for review and approval as part of the Quartz Mining License application (Yukon Water Board 2013). The detailed Occupational Health and Safety Plan will outline potential worker exposure scenarios and

procedures to minimize worker exposure. The Occupational Health and Safety Plan will also outline how worker health and safety will be monitored and what measures will be utilized in exposure situations. In addition to the detailed Occupational Health and Safety Plan, CMC will be required to submit other plans for the Quartz Mining License application that are related to worker health and safety, including:

- A description of all dust control measures that will be employed to ensure worker health and safety and minimize effects on the environment;
- A Spill Contingency Management Plan (preliminary plan provided in Appendix A.22B) to communicate to staff, contractors, and workers the actions to be taken when responding to spills during mine construction, operation and closure; and
- An Emergency Response Plan (Appendix 22B) which will be reviewed for completeness by the Yukon Workers' Compensation Health and Safety Board, and will include procedures for the protection of worker and public health and safety in the event of accidents or malfunctions.

A.21.3 GENERAL EMERGENCY

A.21.3.1.1 R418

R418. Clarification of the procedures that will be established in the event of a Level II Emergency Event, as defined in the conceptual Emergency Response Plan, and how these procedures rely on existing infrastructure and services.

Spill response procedures are outlined in the Spill Contingency Management Plan (Appendix A.22B), and the plan includes details on the emergency response organization and responsibilities, as well as key external emergency contacts. R418 refers to the procedures in the event of a Level II Emergency, which is defined as:

"Level II: includes intermediate level spills requiring response by on-site or off-site trained staff but *posing no danger to the public*".

For medical emergencies, the Medical Responder on-site will assess the nature of the medical emergency and status of the patient to determine if further actions such as medevac to a hospital are required. CMC will provide first aid stations, an on-site medical clinic, and emergency vehicles with the necessary medical equipment, medications, and supplies supported by qualified and trained medical staff.

In the event of a medical emergency (i.e. major trauma cases), the Medical Responder will contact Yukon Emergency Medical Services (EMS) Dispatch (Table A.21.3-1) to provide history and an assessment of the situation. Medical support and/or evacuation is possible by air transport via the Casino Mine airstrip to support fixed-wing air ambulance.

The primary community in which off-site services will be relied on is Whitehorse. Baseline data on community services reveal capacity constraints in the ability of community health centres to provide services to meet local demand. In Pelly Crossing, the community health centre has no regular, permanent staff and specialist services are available infrequently. No emergency care is available and patients are transported to the Whitehorse General Hospital. While the health centre in Carmacks has a larger facility (two exam rooms that can be used for trauma) and staffed by two nurses, it is understaffed and is relied on to service the Minto Mine for treating injuries. Whitehorse is a feasible option with wide-range of services available at the Whitehorse General Hospital, particularly emergency care.

Casino will ensure that a number of trained personnel holding certificates of competence in Surface Mine Rescue valid in the Yukon or similar certification, will be present at the site at all times. A Medical Responder will also be

on site at all times who will be responsible for providing medical attention if required and contacting/coordinating with outside medical resources if required. The Casino Health and Safety Manager will ensure that a list of names and location of all Mine Rescue and Emergency Response Personnel is posted in designated locations at all times for quick reference. This list will be updated as per shift rotations to ensure rescue and emergency response personnel are on site and available.

As noted, these emergency response procedures are generally outlined in the Emergency Response Plan (ERP - Appendix 22B); the ERP in the Proposal is a conceptual plan, and specifics on CMC's response procedures for Level II emergencies will be outlined in the detailed ERPs prior to initiation of the construction phase. CMC will incorporate Yukon Government and local first responders into the process for finalizing the conceptual ERP.

In regards to use of existing infrastructure and services, Casino will establish a Mutual Aid Agreement (MAA) in conjunction with the QML process with other mines and agencies in the surrounding area. A MAA is an agreement between agencies and/or jurisdictions in which they commit to assist one another upon request by furnishing resources.

The Emergency Response Team will be made up of CMC personnel who will be responsible for managing emergency situations. CMC will ensure that sufficient trained emergency response personnel are on site at all times. The Incident Commander or designate will assume responsibility for each incident in consultation with senior management, the Emergency Response Coordinator, and relevant Governmental Agencies. The Incident Commander is the primary decision-maker for assessing and responding to incidents at the Project site and along the Freegold Road. The incident response organizational structure is depicted in Figure A.21.3-1.

Key external emergency contacts are provided in Table A.21.3-1. This list is not intended to be all inclusive at this stage and will be updated prior to beginning the construction phase of the Project. An emergency response responsibility matrix will also be created for definition and quick reference.

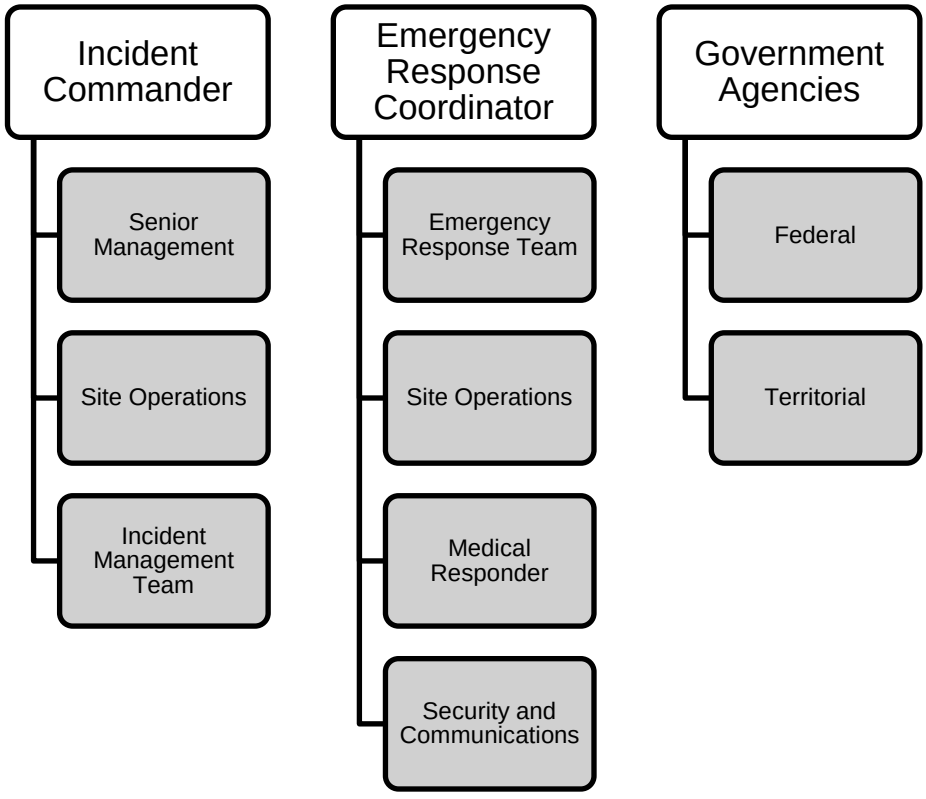

Figure A.21.3-1 Emergency Response Organizational Chart

Table A.21.3-1 External Emergency Contact List

Contact Name	Contact Number
Health Care Providers	
Whitehorse Regional Hospital	(867) 393–8700
Carmacks Health Centre	(867) 863-4444
Pelly Crossing Health Centre	(867) 537-4444
Emergency Responders	
Fire Department – Pelly (Emergency)	(867) 537-3000
Fire Department – Whitehorse	(867) 668-8699 or (867) 668-2462
Police – Pelly	(867) 537-5555
Police – Carmacks	(867) 863-2677
Police – Whitehorse	(867) 667-5555
Yukon EMS, Dispatch	(867) 667–3333
Poisonous Substance Ingestion	(867) 633–8477
Yukon Territory Government Contacts	
Yukon Dept. of Conservation	(867) 667–5317
Yukon Dept. of Fish & Game	(867) 393–6722
Yukon Spill Report Center	(867) 667–7244
Yukon Energy (afterhours)	(800) 676–2843
Yukon Workers' Compensation Health and Safety Board	(867) 667–5450
Yukon Occupational Health and Safety Mine Inspector	(800) 661–0443
Yukon Coroner's Office	(867) 667–5317
Helicopter Service Providers	
Capitol Helicopters	(867) 668-6200
HeliDynamics	(867) 668-3536
TransNorth Helicopters	(867) 668-2177 (Whitehorse) (867) 863-5551 (Carmacks)
Fixed Wing Service Providers	
Alkan Air	(867) 668-7725

A.21.3.1.2 R419

R419. For accidents on the Freegold Road, a description of how emergency services will be coordinated, and where these services will come from.

As detailed in the ERP (Appendix 22B), all traffic associated with the Project will be managed in accordance with the Road Use Plan (updated in Appendix A.22E). Radio communication will be available along all roads to allow for rapid communication with divers and reporting of incidents. Once an accident has been reported, incident response will conform to the procedures outlined in the ERP, and incident response will follow the organizational structure depicted in Figure A.21.3-1.

Anticipated requirements for on-site equipment and services will also vary based on the nature of the emergencies, and response procedures for addressing the emergency. All will be identified in the emergency-specific, comprehensive plans to be developed in consultation with relevant agencies. A standard requirement will

be to maintain a mine rescue equipment inventory list that will be compiled regularly. Standard mine rescue and emergency equipment which may be maintained on-site are:

- protective gear for firefighting and hazardous material handling;
- a fully equipped rescue vehicle;
- an ambulance;
- mobile medical treatment unit;
- oxygen tanks;
- firefighting equipment (e.g. fire extinguishers) ;
- a fire truck;
- 4x4 truck with stretchers;
- Emergency kit containing wound management, burn dressings, sterile water, bandages and dressings;
- dedicated communications devices (hand-held and vehicle-mounted); and
- tools (e.g., axes, shovels, cutters, and saws).

For medical emergencies the on-site Medical Responder will assess the nature of the medical emergency and status of the patient to determine if further actions such as medevac to a hospital are required. CMC will provide first aid stations, an on-site medical clinic, and emergency vehicles with the necessary medical equipment, medications, and supplies supported by qualified and trained medical staff.

In the event of a medical emergency (i.e., major trauma cases), the Medical Responder will contact Yukon Emergency Medical Services (EMS) Dispatch (Table A.21.3-1) to provide history and an assessment of the situation. Medical support and/or evacuation is possible by air transport via the Casino Mine airstrip to support fixed-wing air ambulance.

CMC will arrange meetings with local health centres and service providers to develop a collaborative medical emergency response strategy and communication plan for sharing information related to medical protocols and the ERP. CMC will work closely on an ongoing basis with Whitehorse General Hospital, local fire departments, RCMP and Yukon Ambulance to engage on these efforts.

In the event of fire and explosion along the road, support may be requested from the Carmacks or Whitehorse emergency services (recognizing that the Fire departments cannot operate outside of municipal boundaries). CMC will be proactive in minimizing the risk of fires and explosions. The use of oil and other related fuels and fluids (i.e., diesel, lubricating oils, hydraulic fluids) will meet Yukon Government permits and Federal and Territorial codes and standards.

A.21.3.1.3 R420

R420. A description of any discussions between CMC and protective and emergency services regarding increases in traffic and therefore and increase in accidents on the Freegold Road, Alaska Highway or Klondike Highway?

Casino Mining Corporation has initiated discussions with the Yukon Government Department of Highways and Public Works in regards to increased traffic on the Freegold Road, Alaska Highway and Klondike Highway. Yukon Government has established an internal working group for CMC to inform and coordinate information about the

project to all departments with responsibilities. Yukon Government Department of Highways and Public Works is conducting an internal analysis to examine future requirements for road infrastructure and upgrades in response to the increased traffic that may result from planned resource projects in the Dawson Range, including the Casino Project. One of the objectives of this analysis, and any work that may be conducted along the public highways, is to ensure design standards and maintenance are appropriate to ensure public safety. Discussions between Yukon Government related to road infrastructure requirements are expected to continue.

CMC has developed a number of elements that would be included in a *Highway Traffic Management Plan* for the management of incidents that could occur along the highway and the Freegold Road:

Spills and Emergency Response

An Emergency Response Plan (Appendix 22B of the proposal) provides a framework for developing comprehensive response plans to both traffic emergencies and spills. CMC has committed to developing these comprehensive response plans prior to construction.

The potential risk of spills during material transport will be minimized by:

- Contracting transport companies with suitable safety and training programs for their drivers;
- Contracting transport companies with vehicle tracking systems;
- Maintaining and operating vehicles consistent with the Highways Act and Regulations (Yukon); and
- Handling materials consistent with requirements set out in Transport Canada's Transportation of Dangerous Goods Act and Regulations.

A Spill Contingency Management Plan (preliminary plan provided in Appendix A.22B) will be developed prior to construction and operations and will be applied in the event of a spill to control and decrease any potential adverse effects to people and the environment. The following components will be included in the final Spill Contingency Management Plan:

- Spill categories;
- Spill prevention procedures;
- Spill response plan;
- Roles and responsibilities;
- Training;
- Internal and external reporting; and
- Monitoring.

Vehicles transporting materials for the project will be equipped with the required spill response kits and drivers trained as appropriate responders.

CMC will develop a Hazardous Materials Management Plan (preliminary plan provided in Appendix A.22A) prior to construction and operations. CMC will also develop a specific Cyanide Management Plan and Liquid Natural Gas (LNG) Management Plan (preliminary plan in Appendix A.22G). These plans will stipulate requirements for transportation contractors and identify policies around personnel and training for the management of these materials for the project. The plans will outline handling, storage and use of the material as well as risks and emergency response.

Effects of Project-related Traffic on other Highway Users

Traffic analyses completed by CMC indicate that project-related traffic will constitute a relatively small proportion of vehicles using the North Klondike, South Klondike and Alaska highways. Input received from Transportation Planning, Highways and Public Works, Yukon Government indicates that lighter project-related vehicles (Federal Highway Administration (FHWA) Classes 3-7) are unlikely to result in adverse effects to other road users.

Project-related trailer truck traffic (FHWA Classes 8-13) will also result in small proportional increases in traffic along segments of the North Klondike, South Klondike and Alaska highways. All three highways have design capacities that greatly exceed current traffic volumes and project-related traffic. CMC anticipates insignificant effects (infrequent, low magnitude, reversible) of project-related truck traffic on other highway users. CMC will work with Yukon Government Department of Highways and Public Works to monitor, and actively manage if required, potential interactions between project-related trailer truck traffic and other public highway users.

A.21.3.1.4 R421

R421. Details regarding on-site personnel, equipment, and services that are provided based on anticipated requirements.

The emergency responses identified in the ERP (Appendix 22B) will be further developed in the comprehensive plans. The personnel, equipment and services requirements will be developed and scaled relative to the size of workforce on site and scope of project activities that are appropriate for the different emergencies identified.

However, at a preliminary scoping level, the Casino Mine Project will have the following on-site personnel, equipment and services:

Medical Response

- Medical responder
- First aid stations
- On-site medical clinic
- Emergency vehicles with the necessary medical equipment
- medications and supplies for First Aid
- Basic Life Support equipment supported by qualified and trained medical staff

Emergency Response

As per the ERP, an Emergency Response Team (Figure A.21.3-1) made up of CMC staff will be responsible for managing the following anticipated emergencies: spill response, fire and explosion, mine infrastructure failure, medical, extreme weather, natural disaster, missing persons, bear encounters, traffic, and site evacuation. The Incident Commander will be responsible for decision-making for managing and responding to emergencies at any given time, and will be in consultation with the Emergency Response Coordinator and appropriate regulatory agencies. The Incident Commander will also be responsible for following the response procedures contained in the comprehensive plans developed specifically for each emergency.

Anticipated requirements for on-site equipment and services will also vary based on the nature of the emergencies, and response procedures for addressing the emergency. All will be identified in the emergency-specific, comprehensive plans to be developed in consultation with agencies. A standard requirement will be to maintain a mine rescue equipment inventory list that will be compiled regularly. Standard mine rescue and emergency equipment which may be maintained on-site are:

- protective gear for firefighting and hazardous material handling;
- a fully equipped rescue vehicle;
- an ambulance;
- mobile medical treatment unit;
- oxygen tanks;
- firefighting equipment (e.g. fire extinguishers) ;
- a fire truck;
- 4x4 truck with stretchers;
- Emergency kit containing wound management, burn dressings, sterile water, bandages and dressings;
- dedicated communications devices (hand-held and vehicle-mounted); and
- tools (e.g., axes, shovels, cutters, and saws).

A.21.3.2 Evacuation

A.21.3.2.1 R422

R422. Describe and outline how would the mine site be evacuated in different seasons. Details should include:
a. length of time an evacuation would require; and
b. logistics for transportation.

Evacuations may be required in the event of danger to worker health and/or safety, including natural disasters such as earthquake, wildfire or extreme weather. A general Site Evacuation Plan will be prepared for the Casino mine site for emergency situations where the Emergency Response Coordinator and/or the Incident Commander deem that an evacuation is necessary. A site wide notification either by radio, phone, or alarm system will be established and all staff and contractors on the site will be made aware of its use. Muster station(s) will be set up at the mine site and all personnel will be made aware of the locations. The key element of the mine evacuation plan will be to ensure that all staff, contractors and visitors are accounted for and that all personnel are evacuated in a rapid and safe manner.

As per the ERP (Appendix 22B), an Emergency Response Team made up of CMC staff will be responsible for dictating when evacuation is necessary and subsequently managing the evacuation. The Incident Commander will be responsible for decision-making for managing and responding emergencies at any given time, and will be in consultation with the Emergency Response Coordinator and appropriate regulatory agencies (Figure A.21.3-1). The Incident Commander will also be responsible for following the response procedures contained in the comprehensive plans developed specifically for each emergency.

Off-site infrastructure and emergency services will be needed in the event of fire, explosion, and medical emergencies that require an evacuation. Evacuation would be possible via the following methods and arrangements will be made by the designated travel coordinator:

1. Road evacuation: This could include transportation by coach, or on-site vehicles, depending on the capacity of the on-site vehicles. If on-site vehicles are not sufficient, coaches may need to be brought in

from Whitehorse (~47 passengers/bus). The trip from the Project to Whitehorse will be approximately 4 hours one direction, once the Freegold Road extension is constructed.

2. Fixed wing: During operations, the airstrip will be able to accommodate a fixed wing aircraft that can transport up to 50 people per flight as well as smaller aircraft that can accommodate from 2 to 14 passengers. Fixed wing transportation is dependent on weather conditions, especially during extreme weather events. The flight from the Project to Whitehorse is approximately 1.5 hours one way.

Evacuation procedures, emergency exit routes, and muster points for each building will be posted throughout the mine buildings, including each individual room in the camp.

A.21.4 FIRE

A.21.4.1 Mine Infrastructure and Fire

A.21.4.1.1 R423

R423. The rationale for two hours, or 682 m³, as the minimum capacity for water storage for on-site firefighting capacity.

The Emergency Response Plan (Appendix 22B of the Proposal) states that fresh water for firefighting will be provided from the Yukon River Valley Pipeline. On-site water requirement for firefighting is satisfied by ensuring a reserve capacity of in the lower portion of the freshwater pond that is unavailable for other uses. Fire water storage and distribution is shown on flow sheet 000-FS-014 in Appendix A.4M.

Prior to the completion and commissioning of the Yukon River Valley Pipeline at the start of Year 1, emergency firefighting water requirements of the Casino mine site will be met using fresh water retained within the Temporary Freshwater Supply Pond (TFSP).

The fire water requirement was dictated by the Feasibility Study (M3 2013), which stated that "*The fire water requirement is 341 m^3/hr for two hours. This demand is satisfied by a fire reserve capacity of 682 m^3 in the lower portion of the freshwater pond that will be unavailable for other uses"*.

A.21.4.1.2 R424

R424. Confirmation of where off-site emergency fire services for the Project will come from.

In the event of a fire that cannot be managed by on-site services alone (i.e., along the road), support may be requested from the Carmacks or Whitehorse emergency services (Table A.21.3-1). CMC will be proactive in minimizing the risk of fires and explosions. The use of oil and other related fuels and fluids (i.e diesel, lubricating oils, hydraulic fluids) will meet Yukon Government permits and Federal and Territorial codes and standards.

Typically, remote mine sites with a large number of employees and contractors establishes a Mutual Aid Agreement (MAA) (e.g., Minto Mine (Capstone 2014) and Eagle Gold Mine (StrataGold Corporation 2013)), that establishes an agreement between agencies and/or jurisdictions in which they commit to assist one another in the event of an emergency. CMC would likely establish MAAs with other operations in the area, including the Minto Mine, as well as with YG and the Village of Carmacks.

While the Village of Carmacks has limited fire protection services (12 volunteer personnel, two tanker trucks and radio communication), the municipal fire departments cannot operate outside of municipal boundaries. Therefore, the Casino Mine would rely on support from the Yukon Government, Department of Community Services, Wildland Fire Management Program (867-456-3845; seasonal offices in Carmacks: 867-863-2408).

A.21.4.1.3 R425

R425. A description of the human element in fire suppression and equipment available including:
a. the level of training will be available to workers in fire suppression;
b. a description of firefighting infrastructure will be on-site; and
c. a description of any equipment available for first responders.

Part a.

Typical training provided to members of the Emergency Response Team includes:

- Standard First Aid;
- Surface Mine Rescue;
- Industrial Fire Brigade under NFPA 1081;
- Spill Response;
- Hazardous Materials Handling; and
- Workplace Hazardous Material Information System.

Part b.

Typical firefighting infrastructure will be dictated by requirements in the *Building Standards Act* and *Regulations*, and may include:

- Camp infrastructure:
- Fire water storage tank and associated distribution system with hydrants
- Hoses at appropriate intervals
- Fire extinguishers
- Mill and mine infrastructure:
- Fire water storage tank and associated distribution system with hydrants
- Fire suppression system (sprinklers)
- Fire extinguishers

Part c.

Anticipated requirements for on-site equipment will also vary based on the nature of the emergencies, and response procedures for addressing the emergency. All will be identified in the emergency-specific, comprehensive plans to be developed in consultation with agencies. A standard requirement will be to maintain a mine rescue equipment inventory list that will be compiled regularly. Standard mine rescue and emergency equipment which may be maintained on-site are:

- protective gear for firefighting and hazardous material handling;
- a fully equipped rescue vehicle;
- an ambulance;
- mobile medical treatment unit;

- oxygen tanks;
- firefighting equipment (e.g. fire extinguishers) ;
- a fire truck;
- 4x4 truck with stretchers;
- Emergency kit containing wound management, burn dressings, sterile water, bandages and dressings;
- dedicated communications devices (hand-held and vehicle-mounted); and
- tools (e.g., axes, shovels, cutters, and saws).

Again, the emergency responses identified in the ERP will be further developed in the comprehensive plans. The personnel, equipment and services requirements will be developed and scaled relative to the size of workforce on site and scope of project activities that are appropriate for the different emergencies identified.

A.21.4.1.4 R426

R426. An elaboration on the need or absence of need for non-water jet firefighting methods.

Non-water based fire suppression systems will be required in areas where water exacerbates fires, for example:

- Reagents storage;
- Electrical rooms – designed as non-combustible structures or vaults, chemical suppression system; may include inert gas suppression systems;
- LNG – chemical suppression system;
- Kitchen – chemical fire extinguishers;
- Vehicles and equipment – chemical fire extinguishers;
- Remote out buildings - chemical fire extinguishers; and
- Fuel storage – chemical fire extinguishers.

All fire-fighting protocols will be tailored to the needs of the Project during detailed design, and as required by the *Building Standards Act and Regulations*.

A.21.4.1.5 R427

R427. Description of the consideration of fire at the cyanide, LNG, or explosives facilities.

The Emergency Response Plan (ERP) submitted for the final configuration of the Casino Project under the *Quartz Mining Act* and the *Waters Act* will contain procedures for firefighting of specific areas of the mine site. At this time, specific details of the firefighting components at the mine are not yet determined, but will be dictated by requirements in the *Building Standards Act and Regulations* and by insurance provider requirements. Typical responses for cyanide, LNG and explosive facilities are detailed below.

Generally, the Emergency Response Team will be trained on emergency response procedures, and will be aware of the need to consult the material safety data sheets (MSDS) for each potentially hazardous material stored and used in the mill processing facilities. A fire suppression system may be installed within the mill, and may consist of a sprinkler system, or of a water distribution system with hydrants.

Cyanide

Cyanide is delivered as sodium cyanide briquettes, and will be stored with other chemical reagents in the mill processing building. While sodium cyanide is generally non-combustible, it can decompose upon exposure to heat, and produce potentially toxic fumes of hydrogen cyanide and ammonia. Only if it is safe to do so, therefore, the sodium cyanide briquettes should be removed from the path of the fire. Because sodium cyanide can result in acute toxicity via inhalation, dermal, and oral exposure, it is important that fire fighting methods do not result in the spread of the material. Therefore, fire suppression through a water fog system is required instead of carbon dioxide or water jet extinguishers.

LNG

The LNG Management Plan (Appendix A.22G) details emergency response procedures for a vapor-cloud ignition/explosion jet fire following a leak from piping, flash fire following a release, pool fire in the secondary containment following a release, and a boiling liquid expanding vapor explosion (BLEVE). Generally, the response for an LNG fire is to:

1. *Assess the situation* – determine the wind direction and park vehicles in an upwind position. Eliminate sources of ignition such as cars and trucks (i.e. do not leave engines running or start stalled engines).
2. *Protect the area* – secure the area around the leak to limit non-essential personnel to a safe distance from the leak. Enter with caution, erect barricades, and evacuate people if needed. Establish a command site at the area to ensure proper communications between emergency response personnel. Try to prevent the spread of the fire itself. Avoid forced ventilation of structures and excavations as that can increase the likelihood of a flammable atmosphere.
3. *Contact Emergency Responders* – to secure the area.
4. *Work together* – ensure that the local, the operator, and emergency responders have proper communications and are working to resolving the emergency.

Explosive Facilities

The explosives facility is an explosives magazine located northeast of the Open Pit. Explosives will be prepared and stored in accordance with the explosives license issued by Natural Resources Canada to a licensed explosives contractor hired by CMC; explosives and blast caps will be stored in separate facilities, away from operational areas. CMC will obtain an Explosives Act magazine license requirements with respect to storage and handling of explosives, and necessary permits including Blasting Permit, Magazine license, Factory license, ANFO Certificate, Purchase and Possession Permit, Explosives and Hazardous Materials Transport Permit.

Explosive storage areas are necessarily located away from camp and other facilities, and a qualified explosives contractor will be retained to provided blasting services and will mix and dispense explosives into the blast holes. Strict safety protocols will be observed during blasting operations.

As detailed in Section 4, CMC will engage in discussions with potential licensed explosives contractors to determine final requirements for the explosives facility. The explosives facility will be located at the north end of the Casino mine site, taking into consideration Natural Resources Canada (NRCan) requirements for siting. All materials will be stored in accordance with the applicable regulations and standards and are managed by an NRCan licensed explosives contractor.

Prior to construction of the explosives facilities, the soils in the footprint of the buildings will be salvaged and stockpiled locally in windrows adjacent to the disturbance sites or in designated soil stockpile areas. The designated areas will be graded and surrounded by a perimeter berm with a minimum height of 1.2 m, and a single gated lockable entry point, as per requirements of the explosive‘s license.

The specifications of the explosives facility will be determined by the explosives contractor to match the anticipated rate of use for the Casino Project. In general, an explosives facility consists of:

- Bulk ammonium nitrate outdoor storage area (silos);
- Bulk fuel area;
- Magazine for storage of detonators, detonating cord, boosters ;
- Emulsion manufacturing facility;
- Wash bay;
- Maintenance facility; and
- Trucks.

The licensed blasting contractor will supply all the surface facilities for the explosives magazines and for storage of blasting supplies.

Under the NRCan Guidelines for Bulk Explosives Facilities Minimum Requirements a Fire Safety Plan must be developed. The Explosive Regulatory Division provides guidelines (NRCan 2014) on what the plan must contain, including:

- licensee information;
- measures to be taken to minimize the likelihood of a fire at the site and to control the spread of any fire;
- emergency procedures for responding to a fire;
- procedures for determining if a fire should be fought; and
- measures to be taken to train employees in the measures, procedures, and circumstances described in the plan.

CMC will develop all plans required under the *Explosives Act and Regulations (2013)*.

A.21.4.1.6 R428

R428. A description of any plans to train and familiarize first responders with the Project and associated hazards, infrastructure, and layout.

As discussed above, remote mine sites with a large number of employees and contractors typically establish a Mutual Aid Agreement (MAA) (e.g., Minto Mine (Capstone 2014) and Eagle Gold Mine (StrataGold Corporation 2013)), that establishes an agreement between agencies and/or jurisdictions in which they commit to assist one another in the event of an emergency. CMC would likely establish MAAs with other operations in the area, including the Minto Mine, as well as with YG and the Village of Carmacks. Casino will provide Emergency Response Plans to all MAA partners. Additionally, a document containing hazards, infrastructure, layout, Emergency Response organization chart, etc. will be updated regularly and provided to MAA partners. Quarterly meetings with MAA partners may be proposed to be held to inform of any new hazards or provide any updates. Site visits may also be completed upon entering into MAA partnerships, and may also occur on a quarterly or bi-annual basis if necessary.

A.21.5 MEDICAL AND HEALTH

A.21.5.1.1 R431

R431. A description of any medical infrastructure that will be in place on-site regarding medical emergencies, and the depth of nursing, pharmaceutical, and first aid services that CMC forecasts as being available on-site.

CMC will provide an on-site health clinic staffed by a full-time registered nurse. On-site health services will include drug and alcohol testing, STI testing, physical exams, patient referrals, and general health care. Given the challenges and costs associated with providing full time physicians and specialized health care providers on site, some care may be provided by satellite (satellite health care). The primary community in which off-site specialized services (those not available on-site) will be relied on is Whitehorse.

For medical emergencies the Medical Responder on-site will assess the nature of the medical emergency and status of the patience to determine if further actions such as medevac to a hospital are required. CMC will provide first aid stations, an on-site medical clinic, and emergency vehicles with the necessary medical equipment, medications, and supplies at First Aid, Basic Life Support supported by qualified and trained medical staff.

In the event of a medical emergency (i.e., major trauma cases), the Medical Responder will contact Yukon Emergency Medical Services (EMS) Dispatch at 867-667-3333 to provide history and an assessment of the situation. Medical support and/or evacuation is possible by air transport via the Casino Mine airstrip to support fixed-wing air ambulance. Helicopter services may be utilized if Yukon EMS Dispatch is unable to provide support necessary for medical emergency evacuations.

CMC will arrange meetings with local health centres and service providers to develop a collaborative medical emergency response strategy and communication plan for sharing information related to medical protocols and the Emergency Response Plan (ERP). CMC will work closely on an ongoing basis with Whitehorse General Hospital, local fire departments, RCMP and Yukon Ambulance to engage on these efforts.

Standard emergency medical equipment that will be maintained on-site includes:

- An ambulance;
- Mobile medical treatment unit;
- Oxygen tanks;
- 4x4 truck with stretchers;
- Emergency kit containing wound management, burn dressings, sterile water, bandages and dressings; and
- Dedicated communications devices (hand-held and vehicle-mounted).

A.21.5.1.2 R432

R432. Details on the capacity to provide medical treatment planned in event of a potential delay to emergency response. Please describe this in terms of both the ability to provide emergency medical care for multiple casualties concurrently as well as in terms of overall duration and level of care.

The Casino Mine must comply with the *Yukon Occupational Health and Safety Regulations*, which includes, at a minimum that CMC:

- Assess the risks that workers are likely to encounter at the workplace;
- Provide and maintain equipment, supplies, facilities, first-aid attendants and services that enable the prompt rendering of first aid to workers and emergency transportation;
- For an isolated workplace with 200 or more workers under Class A type work, for any shift at all times, provide:
    - Level 3 first-aid kit;
    - One advanced first-aid attendant;
    - Two standard first-aid attendants;
    - One standard first-aid attendant for each additional increment of 1 to 100 workers; and
    - A first-aid room (requirements for a first-aid room are also outlined in the *Yukon Occupational Health and Safety Regulations – Part 18*).

CMC will provide first aid stations, an on-site medical clinic, and emergency vehicles with the necessary medical equipment, medications, and supplies supported by qualified and trained medical staff.

CMC will provide an on-site health clinic staffed by a full-time registered nurse. Emergency Response Team members will also be trained in First Aid. As per the *Yukon Occupational Health and Safety Regulations – Part 18*, the first-aid attendant is responsible for all first-aid treatment of an injured worker until "responsibility for treatment is accepted at a medical facility; by an ambulance service; or by a person whose credentials in first-aid treatment are equivalent or superior to those of the first-aid attendant".

A Medical Responder (MR) and Emergency Response Team (ERT) will be on site at all times. The MR will be a certified Emergency Medical Technology (EMT) Paramedic. Triage decisions will be made by the ERT and MR, and will be based on patient condition and medical capacity of MR and ERT to provide patient care.

As discussed in the response to R422, medical evacuation will be arranged by the Yukon Emergency Medical Services (EMS) Dispatch. EMS typically arranges for medical support and/or evacuation via fixed-wing air ambulance. Helicopter services may be utilized if Yukon EMS Dispatch is unable to provide support necessary for medical emergency evacuations. If access by aircraft is not possible due to weather, the on-site ambulance may be driven along the Freegold Road to Carmacks (an estimated three hour drive), with support from the first-aid attendant and/or nurse. Carmacks has a government funded nursing station.

CMC will arrange meetings with local health centres and service providers to develop a collaborative medical emergency response strategy and communication plan for sharing information related to medical protocols and the Emergency Response Plan (ERP). CMC will work closely on an ongoing basis with Whitehorse General Hospital, local fire departments, RCMP and Yukon Ambulance to engage on these efforts.

A.21.5.1.3 R433

R433. Considering the remote nature of the Freegold Road, a description of medical and communication capacity along the Freegold Road and its extension including the need or absence of need for any helipads.

Radio communication will be available along all roads to allow for rapid communication with drivers and reporting of incidents. CMC will create a communications protocol with respect to the road, which will inform road users with timely information as it pertains to road access, conditions, wildlife etc. The Emergency Response Plan (ERP) will be created in collaboration with regional emergency responders, and will include details of emergency response

procedures along the Freegold Road extension. All emergency response protocols details in the Proposal and herein will apply to the Freegold Road. The absence or need for helipads will be evaluated when the ERP is written; although, as the Freegold Road will be 8.2 m wide with maximum grades of 8% the road clearance may be sufficiently wide to allow landing a helicopter on the roadway surface (minimum clearance for a helicopter ~12 m). These may also be incorporated into the detailed design requirements for the Freegold Road design.

All project personnel will have access to hand-held or stationary radios. Additionally, the Health and Safety Manager, Medical Responder, and the Emergency Response Team will be equipped with satellite phones.

Given the length of the road and the remoteness of any emergency response capabilities CMC will enter into discussions with Yukon Government Emergency Medical Services department and Community Services department to discuss and agree upon any potential staging grounds for emergency response along the road, where appropriate.

A.21.5.1.4 R434

R434. A description of how a destination medical facility will be chosen and the threshold for medevac.

Casino will have an onsite Medical Responder (MR) at all times. The MR will have established a medical emergency protocol with Yukon Emergency Medical Services (YEMS), in addition to a General Physician (GP) who will be available on a 24 hour basis to provide assistance with patient care in serious medical emergencies. The GP and/or MR will undertake a patient assessment and determine if a medical evacuation is necessary. If so, the MR will contact YEMS and provide the patient's medical history and assessment. In consultation with the YEMS dispatch, CMC will be responsible for determining the appropriate transportation method for the medical evacuation.

The MR will be responsible for developing a patient care strategy during the time prior to the patient being transported, which will include the following assessment criteria:

- Non-urgent – Non-critical, stable patients that require further medical assessment or treatment but do not require medical attention during transfer will be transported to offsite medical care facilities by a designated employee via fixed wing aircraft.
- Urgent – Non-critical, stable patients that require further medical assessment or treatment but do require medical attention during transfer will be transported to offsite medical care facilities by air ambulance.
- Immediate - Critical, unstable patients will be transported to the appropriate medical care facility by air ambulance. CMC will coordinate the evacuation and ensure that the receiving medical care facility is prepared to accept the patient, with the appropriate medical team.

The primary community in which off-site services will be relied on is Whitehorse. Baseline data on community services reveal capacity constraints in the ability of community health centres to provide services to meet local demand. In Pelly Crossing, the community health centre has no regular, permanent staff and specialist services are available infrequently. No emergency care is available and patients are transported to the Whitehorse General Hospital. While the health centre in Carmacks has a larger facility (two exam rooms that can be used for trauma) and staffed by two nurses, it is understaffed and is relied on to service the Minto Mine for treating injuries. Whitehorse is a feasible option with wide-range of services available at the Whitehorse General Hospital, particularly emergency care.

A.21.6 EMERGENCY SERVICES AND OTHER USERS

A.21.6.1.1 R446

R446. Describe how emergency and non-emergency services in Carmacks were factored into Project plans and design. Consideration should be given to health, law enforcement, conservation, and other government services.

As discussed above, the primary community in which off-site services will be relied on is Whitehorse. Baseline data on community services reveal capacity constraints in the ability of community health centres to provide services to meet existing local demand. In Pelly Crossing, the community health centre has no regular, permanent staff and specialist services are available infrequently. No emergency care is available and patients are transported to the Whitehorse General Hospital. While the health centre in Carmacks has a larger facility (two exam rooms that can be used for trauma) and staffed by two nurses, it is understaffed and is relied on to service the Minto Mine for treating injuries. Whitehorse is a feasible option with wide-range of services available at the Whitehorse General Hospital, particularly emergency care.

A.21.7 ACCIDENTS AND MALFUNCTIONS

A.21.7.1.1 R447

R447. A detailed characterization of potential major mine infrastructure failures and proposed response measures to these events.

As detailed in Section A.4, dam inundation mapping will be conducted to evaluate the proposed design, and determine credible modes of failure, tailings outflow volume, peak discharge, maximum downstream distance for the initial water driven flood wave, maximum downstream distance for tailings slumping, and the width of the zone of influence resulting from the dam break analysis. The risk assessment process enables a quantitative assessment of potential risks and their effects and provides for the development of appropriate mitigation and management plans, as well as emergency response measures.

A.21.7.1.2 R448

R448. An updated discussion regarding the likelihood and consequence of a TMF embankment failure considering the entire lifetime of the facility (i.e. in perpetuity) in light of updated site condition characterization and dam break/inundation analysis as outlined in other sections of the Adequacy Review Report.

As detailed in Section A.4, dam inundation mapping will be conducted to determine credible modes of failure, and the resultant report will discuss the likelihood and consequence of a TMF embankment failure.