APPENDIX 13

FIRE PLAN

GREENS CREEK MINING COMPANY

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1 INTRODUCTION

This plan will identify Permitted Burns, Fire Prevention, Training and Fire Response.

2 PERMITTED BURNS

This section identifies procedure related to permitted burns. All port welding and hot work must be permitted before work start-up. Special requirements and conditions must be attended to before work start-up including:

Captain of the Port Southeast Alaska shall be notified prior to any welding or burning.

Notification of any welding or burning shall include the following:

- Types of dangerous cargo presently on or at the facility
- The proximity of dangerous cargo to the site of the welding or burning.
- The expected duration of the operation.

Flammable vapors, liquids, or solids must first be completely removed from any container, pipe, or transfer line subject to hot work exposure.

No hot work may be conducted during a fuel transfer.

For other authorization and/or information concerning hot work permits you may contact the U.S. Coast Guard Marine Safety Office.

A copy of the welding and hot work permit must be sent to the Port Operations Department in care of the Marine Safety Office in Juneau, Alaska.

Permits from the Coast Guard are only good for 365 days at that point Greens Creek must re-submit for new permits.

Other permitted burns, including wood burns, etc. will be discussed in the Road Maintenance Section of this appendix.

3 FACILITIES PLAN

Greens Creek Mine has conducted a facility hazard analysis on the following areas:

- Mine
- Concentrator
- Powerhouse
- Administrative/Shop/Dry complex
- Warehouse
- Hawk Inlet
- Road System

3.1 MINE

The mine is located approximately 18 miles southwest of Juneau, Alaska, and is situated in the northern portion of Admiralty Island. The mine is eight miles by road from Hawk Inlet on the Northwestern coast of the island. Access to Hawk Inlet is via air or coastal marine transportation. Young Bay is located five miles from the Hawk Inlet junction then 8.4 miles to the mine for a total of 13.4 miles. Greens Creek's Mine Fire and Emergency Response Plan are within the regulatory requirements set forth by Mine Safety and Health Administration (MSHA).

The mine is comprised of rock that is classified by MSHA as being non-gassy. The classification of non-gassy refers to the results of air monitoring disclosing lower explosive limits for methane or other flammable gases measured at 12 inches (304.8 mm) plus or minus 0.25 inch (6.35 mm) from the roof, face, floor or ribs in any underground work area for three consecutive days.

Combustible fluids used underground are maintained on an as needed basis. When not in use these fluids are kept in approved containers, underground and on the surface.

Waste rags containing flammable or combustible liquids are disposed of properly in covered metal containers.
Machinery is maintained on a regularly scheduled maintenance program and inspections are conducted prior to the start of each shift to eliminate the possibility of a fire resulting from equipment failure. Explosives used underground are stored and shipped in MSHA and Department of Transportation (DOT) approved containers.

The mine's fire suppression system includes four inch main water lines which is fed from a 150,000 gallon water tank. The tank is located directly above the portal at an elevation of 1160 feet, and ABC fire extinguishers are strategically placed throughout the mine.

Inspections are conducted and documented on a daily basis to include such items as ground conditions, equipment maintenance, housekeeping, etc.

General fire fighting training will be held each summer, for mine rescue, surface rescue and

SEAPRO personnel. This training will be conducted by the Juneau Fire Department Training Academy.

Fire extinguishers are checked on a monthly basis and refilled each year.

Fire evacuation drills are performed at least once every six months. These drills are used to assess the ability of all persons underground to reach the surface or other designated points of safety within time limits of the self-rescue devices that would be used during an actual emergency.

3.1.1 Situation Plan/Steps

Go to the nearest mine phone or radio and report nature and location of the emergency, remain on the mine phone or radio until all information has been received.

If access to the portal is cut off or if evacuation routes are questionable, all personnel underground shall report to a predetermined assembly point or nearest refuge chamber and follow instructions from the highest ranking underground supervisor.

Whoever receives the emergency call outside shall immediately notify GCMC supervision and document the information on an emergency information sheet.

Outside personnel will be responsible for initiating the stench system immediately after notification has been received.

All personnel underground shall stop work immediately, shut down equipment and close all valves on compressed gas cylinders, and report to the portal, refuge chamber, or assembly point.

Upon confirmation of a fire underground or if personnel feel the need, personnel shall don their self-rescuers immediately.

Upon confirmation of a fire, the highest ranking underground supervisor shall notify outside as to the location and level of emergency.

The ventilation system shall be left in its normal operating conditions until all information is received as to its effects of the entire underground operation. The General Manager or his/her designated representative such as mine superintendent and/or mine foreman are the only individuals authorized to modify the ventilation system during emergency.

3.1.2 Fire Fighting - Small Fires

A small fire is one that does not create enough smoke, flame and heat to prevent fighting the fire using a hand-held fire extinguisher or a small water hose. Special attention shall be given to the type of fire: Extinguisher can be used on all A-B-C fires while water should only be used on Class A fires.

Small fires are readily fought by the use of hand-held extinguisher so personnel should make a reasonable effort to extinguisher the fire. If two or more people are present, one should fight the fire while one reports the size, type and location in the event the fire grows out of control. Under no circumstances do personnel fight fires after donning of their self-rescuers.

Small fires as aforementioned are referred as fires in the incipient stage.

Personnel will not directly engage any fire which is beyond the incipient stage, i.e., a fire which has progressed to the point it has substantially inundated the structure/equipment or one that involves explosives.

3.1.3 Fire Fighting - Large Fires

A large fire is one that creates enough smoke, flame and heat that will not allow personnel to fight the fire using normal fire fighting equipment.

To extinguish this size fire will require the use of trained mine rescue personnel using self contained breathing apparatuses, and other fire fighting equipment, or by means of bulkheading.

The responsibility to fight the fire or to bulkhead will be directed from the incident command center, usually directed by the mine manager or his/her designated representative.

The highest ranking supervisor or his/her designated representative outside will be responsible for coordinating the following tasks:

- Portal security
- Restricting entrance(s) of personnel underground
- Posting guards at electrical & ventilation controls to prevent accidental power disconnect or reversal without proper authority.
- Notification of off duty mine rescue personnel and equipment call-out list.
- All local, state and federal officials (MSHA, , Paramedics, National Mine Service, etc.)
- Housing and feeding arrangements etc.

Water for firefighting underground as on the surface is fed from a 150,000 gallon tank on located above the portal at the 1160 level.

3.1.4 Escape Plan

If transportation is not available from underground, then, if possible, transportation will be dispatched from the surface and report to assembly points.

If transportation is not available at all, the highest ranking mining supervisor will instruct personnel as the evacuation route to take. A person will be assigned to the rear to ensure all personnel are

accounted for.

All personnel exiting the portal shall ensure that they report and sign out at the dry.

Underground Emergency Barricade:

If fire or any other emergency dictates evacuation to refuge chamber, the highest ranking mining supervisor will ensure that the refuge chamber is safe to access.

Prior to closing and sealing of the refuge chamber door a sign shall be posted outside on the door indicating the number of personnel inside, date and time entered and any medical conditions known.

All personnel once inside refuge chamber shall sit down and remain silent with only one cap lamp on to conserve batteries.

All penetrations into the refuge chamber shall be sealed shut by means of closing valves or sealing (predetermined means of effectively sealing) openings closed.

If voice communication can be maintained with the surface, names of personnel, their conditions and any other information to aid rescuers shall be given.

If ventilation is available into the refuge chamber, it shall be utilized as breathing air and to create a slight positive pressure.

If piped ventilation is not available the stored oxygen cylinders shall be slightly cracked open to provide the same result.

The possibility of being confined for a lengthy period of time is a real possibility. In this case all food shall be stored in a central location for rationing purposes. Again, only one light shall remain on at a time to conserve batteries. Personnel shall take turns walking through the chamber to prevent the stratification of foul air.

Once the refuge chamber doors are closed and sealed, the door shall remained closed until mine rescue personnel state that all is clear.

3.2 CONCENTRATOR

The concentrator building (mill) is approximately 95,000 square feet in total working area, which includes both ground level and upper floor working areas. The mill is constructed of concrete floors and structural steel perimeter walls with steel panels outside. Inside office walls are covered with minimum one hour fire rated gypsum board.

The concentrator (mill) is powered by means of 4160 volts, which is generated from the power

house located on Admiralty Island. The 4160 volts is fed into two feeders which split into 480 volts, still allowing the mill to utilize 4160 volts. All electrical wiring meets or exceeds the requirements set forth by MSHA and National Electric Code (NEC).

The mill's fire suppression system consists of a water supply from a 150,000 gallon tank with 90,000 gallons dedicated for fire protection. The tank is at an elevation of 1160 feet and feeds a 10 inch HDPE pipe that connects to a 6 inch HDPE loop producing 260 feet of static head at the mill site.

The main gate valve will be chained and locked in the open position.

Fire protection to meet National Fire Protection Association (NFPA) for earthquake standards. All equipment is UL listed.

Standpipes are hydraulically designed to supply 100 GPM at 65 PSI at the most remote valve (EL.1001'-6"). The system demand - 100 GPM @ 92.26 PSI residual pressure at base of riser-1000 GPM at 97.5 PSI.

ABC (monoammonium phosphate) fire extinguishers are strategically placed within the mill.

There are approximately 18 separate chemicals used at the mill, of which three are flammable. The three chemicals, Sodium Isopropyl Xanthate, Methyl Amyl Alcohol and Polypropylene Glycol Methyl Ethers are stored in proper approved containers. With proper storage, placement and handling, these chemicals do not pose a fire threat.

If a situation (fire) is observed by any person, they should go to the nearest phone or radio and report the nature and location of the emergency, remain on the phone or radio if possible until all information has been received.

Whoever receives the call shall immediately notify emergency response crews and document information on an emergency information sheet.

3.2.3 Escape Plan

Personnel not directly involved with firefighting will evacuate the building by way of one of four exits, north, south, east and west. Personnel have been instructed to report to the Administration office as to account for all personnel assigned to the mill.

In accordance with National Fire Protection Association (NFPA) 220, chapter 3, the mill is classified as a Type I (443-332) construction. This refers to the type of construction building materials which the structural members, including walls, columns, beams, floors, and roofs, are approved noncombustible or limited-combustible materials and have a fire resistance ratings not less than those found in the table of Fire Resistance Requirements for Type I through Type V Construction, which is found in NFPA 220 page 220-6.

3.3 POWERHOUSE

The powerhouse building is approximately 6600 square feet in size, constructed of steel structural members and steel siding.

The powerhouse is also in accordance with NFPA 220, in that it is classified as a Type I (443-332) construction.

The powerhouse is designed to produce electricity for the entire Greens Creek Mine operation, underground and surface complex, with the exception of Hawk Inlet and tailings facilities. Generation of electricity is accomplished from three Ruston generators and one Caterpillar (CAT) generator (CAT is actually housed outside of powerhouse building).

The powerhouse generates from a range of 1.00 megawatt to an operational load of 4.2 megawatt. The fixed plant capacity of all generators is 8.05 megawatt.

Generators are fueled continuously from a 60,000 gallon fuel tank which is located approximately 125 feet northwest of the powerhouse. The amount of fuel used during an average 24 hour operational period ranges from 6000 to 7200 gallons.

Inside the powerhouse confines is located a 22,000 liter day fuel tank.

Fire suppression system for the power house consists of overhead fire sprinklers and ABC fire extinguishers in the form of hand-held and wheeled. The sprinkler system is activated by heat sensors which are located near the exhaust fans on the ceiling. Sprinkler system is fed from a water supply tank containing 150,000 gallons, of which 90,000 gallons is dedicated to firefighting. The main gate valve is chained and locked in the open position. Fire extinguishers are strategically located throughout the building.

3.3.1 Escape Plan

In the event of a fire, personnel have been directed to evacuate through one of three exits, which are located on the west, east and south sides of the building. Personnel have been instructed to report to the Administration building for accountability.

3.4 ADMINISTRATIVE/SHOP/DRY COMPLEX

The entire complex is approximately 17,000 square feet of work area. The building materials used in construction include non-combustible structural members, including walls, columns, beams, floors, and roofs. Materials used for construction enable this building to be rated as a Type I (433-332) according to NFPA 220, chapter 3.

The electrical power for the entire complex is received from the powerhouse in the form of 480 volts. Power enters the building through the shop area into a 400 amp disconnect, then proceeds through a 75 KVA transformer and distributed throughout the entire complex.

The Administrative portion of the building is designated for engineering, management and general administrative functions, none of which either harbor or manufacture any hazardous or flammable products.

Fire suppression system for the entire complex is comprised of standpipes and fire extinguishers (ABC) placed strategically throughout the complex. One standpipe in the shop area, one in the dry area, and one on the upper floor. Fire extinguishers are placed strategically throughout the shop, dry and upper floor.

The fire suppression standpipe is supplied with water from the 150,000 gallon tank, of which 90,000 gallons is dedicated for mine water and firefighting. The standpipe will have the main gate valve chained and locked in the open position.

3.4.1 Escape Plan Administrative Complex

There are two stair well exits from the upper floor, one on the southeast, and the other on the southwest side of the building, both of which are marked by illuminated signs.

Personnel have been instructed to report to the 860 area for accountability.

3.4.2 Shop

The shop area is designated for major repair and fabrication of equipment and any and all of its components.

The shop area maintains many combustibles and compressed gases, all of which are stored and used in accordance with MSHA and NFPA regulatory guidelines. When not in use, flammables are stored in NFPA approved flammable storage cabinets and compressed gas bottles are shut off with lines bled off.

Outside on the north side of the building, liquids are stored. There are approximately seven separate containers, which store approximately:

- 3800 gallons of hydraulic oil
- 3800 gallons of 15/40 motor oil
- 440 gallons of hydraulic oil
- 440 gallons of ATF transmission oil
- 440 gallons of TDH (rock drill oil) oil
- 500 gallons of anti-freeze
- 1000 gallons of waste oil

Liquids mentioned above are stored in double-walled tanks which sit inside a containment area.

The shop's fire suppression system consists of one standpipe and numerous fire extinguishers placed throughout the shop in potential fire areas.

Used oily rags and empty aerosol cans are disposed in accordance with Environmental Protection Agency (EPA), and NFPA regulatory standards.

3.4.3 Escape Plan Shop

In the unlikely event of a fire, personnel are directed to exit through one of the nine exits, two to the west, three in the north, and four through the east side of the building.

Exits are illuminated by means of battery back-up emergency lighting and illuminated exit signs.

Personnel have been instructed to report to the 860 area for accountability.

3.4.4 Dry

The dry house facility's main purpose is for personnel to change clothes and shower. The Mine Foreman, Surface Superintendent and Safety Representative also have office space provided in the east side of the building.

The cleaning products used in maintaining the dry are stored in metal cabinets within the building and do not pose a fire, safety or environmental hazard. Used cleaning product containers are disposed of according to EPA regulations and in a proper and safe manner as not to pose a potential fire hazard.

3.4.5 Escape Plan Dry

In the unlikely event of a fire in the dry or any other part of the complex, personnel that are not directly involved in firefighting have been instructed to report to the 860 area for accountability.

3.5 WAREHOUSE

The 960 Warehouse is approximately 4500 square feet of storage facility and office space. The building materials used in construction include combustible materials which include the structural members, columns, beams, and roof.

The materials used for construction in the fabrication of the warehouse have resulted in a fire rating of Type V (111-000). This rating is that type in which exterior walls, bearing walls and roof supports are wholly or partly of wood or other approved combustible material.

The electrical power is received from the powerhouse to the warehouse on the east wall, which feeds into a 125 amp breaker, 120/208 3-phase. Total connected load equals 3.9 KVA/15.8 amp.

The main function of the warehouse is to procure and distribute a constant supply of materials, to enable the mine and surface to operate on a daily basis.

The warehouse receives and will continue to receive an increasing amount of combustible materials. These materials will be stored for a period of time before being distributed to various work locations on the island. The method in which they are stored are in accordance with NFPA 231, General Storage.

Fire suppression system for the warehouse incorporates the use of ABC fire extinguishers and an overhead sprinkler system.

Fire extinguishers are placed strategically throughout the warehouse and the sprinkler system is fed from the 150,000 gallon water tank with a supply of 100 GPM at 65 PSI and the system demand at an average working pressure - 100 GPM at 120 PSI residual pressure.

With proper storage and handling of combustibles and adequate fire protection the warehouse does not pose a fire threat.

All surface and underground personnel (fire brigades) will be trained in firefighting from the Juneau Fire Department Training Center.

3.5.1 Escape Plan

In the unlikely event of a fire at the warehouse, all personnel have been instructed to report to the Administration building for accountability.

3.6 HAWK INLET

Hawk Inlet consists of several buildings, the buildings of interest will be the concentrate building, north and south bunkhouse/kitchen, and the Hawk Inlet storage building.

3.6.1 Concentrate Storage

The concentrate building is approximately 60,000 square feet of storage area. The concentrate building is constructed of concrete floors, and structural steel perimeter walls with steel panels outside.

The concentrate building in accordance with NFPA 220, chapter 3, is classified as a Type I (443-332) construction. This refers to the type of construction building materials which are approved as noncombustible or limited combustible.

The electrical for the concentrate building is located on the east side of the building in a separate 12X10 steel shed. Electrical lines are fed 200 feet east underground to the concentrate building where a 480 volt panel box is located.

Main electrical source for Hawk Inlet is generated from two 275 KW, 3406 caterpillar generators and one 300 KW, 3406 Catepilliar.

A 60,000 gallon diesel fuel tank is located approximately 150 feet east of the concentrate building. The tank is bermed to hold 110% of capacity in the event of a leak.

The concentrate building fire suppression system consists of fire extinguishers located throughout the building.

3.6.2 Escape Plan

In the unlikely event of a fire personnel have been instructed to evacuate through one of two exits, one east and one west.

3.6.3 Bunkhouse/Kitchen

Bunkhouse/kitchen is approximately 26,000 square feet of living quarters and kitchen facilities, which encompasses ground floor and a second floor. The bunkhouse/kitchen's exterior walls, bearing walls, and floors and roofs and their supports are wholly or partly of wood or other approved combustible material giving the bunkhouse/kitchen an NFPA rating type of Type V (111-000).

The bunkhouse/kitchen power is produced from the generators located at Hawk Inlet, two 275 KW, 3406 caterpillar and one 300 KW, 3406 Catepilliar. The power then is transferred to a transformer located on the northeast end of the bunkhouse/kitchen which reduces the 480 volts to 120 volts, three phase 480 volt to one phase 120 volt.

Smoke/fire alarms are located throughout the entire complex, with fire extinguishers (ABC) located strategically in hall ways and other areas of assembly.

Located throughout the kitchen are smoke/fire alarms and above the grill and fryers are a fire suppression system that can be actuated in two separate locations within the kitchen.

The bunkhouse/kitchen houses no hazardous or flammable products within the facility. Flammables are stored in approved containers according to NFPA.

The combustible trash that is created at Hawk Inlet and the mine complex is disposed of at the Hawk Inlet incinerator located approximately 100 feet north of the bunkhouse/kitchen. The incinerator meets all federal and state regulations.

A 1000 gallon double-walled fuel tank is located approximately 60 feet east of the bunkhouse/kitchen.This fuel is consumed for heating. A 300 pound wheeled extinguisher and hand held fire extinguishers are located near the tank in the unlikely event of an incident.

The boiler room is located inside the bunkhouse facility, fire alarms and extinguishers are located in and nearby to prevent the further spread of a fire in the unlikely event.

Water for the Hawk Inlet facility is acquired from the Cannery Creek and filtered through a two stage sand filter, chlorinated and then pumped to a 40,000 gallon storage tank. Water is then gravity fed at approximately 30 psi prior to distribution.

Sewage treatment is controlled through a 20,000 gallon filtering tank, no hazardous chemicals are used.

3.6.4 Escape Plan

In the event of a fire, personnel are notified through the fire alarm system and instructed to exit through one of the five exits on the ground floor, three east, one south and one north. On the second floor personnel can exit directly through one of two exterior stairway exits, one north or one south, personnel can also exit through the stairway inside the building then exit through the ground floor exit.

3.6.5 Hawk Inlet Storage Facility

The Hawk Inlet storage facility is approximately 7200 square feet, located approximately 330 feet east of the bunkhouse/kitchen. The building is constructed of steel structural members including walls, columns, beams, floors, roof, and siding which is approved noncombustible or limited-combustible materials and have a fire resistance ratings not less than those found in the table of Fire Resistance Requirements for Type I through Type V Construction, which is found in NFPA 220 page 220-6.

The Hawk Inlet storage facility electrical power (440 volts) is produced from generators located at Hawk Inlet. Power is cabled underground to a panel box (main disconnect) on the east side of the storage facility.

The storage facility is utilized mainly for bulk items such as, engines, wheels and other large items that have been barged in and received at Hawk Inlet. Materials are then distributed either from there, or, taken to the 960 warehouse for distribution. Personnel are not routinely assigned to this building other than for pick up or drop off of materials.

The heating system for the building is a waste oil heater system.

Storage building does not possess a fire suppression system, but, there are fire extinguishers placed strategically throughout the building.

3.7 ROAD SYSTEM

The road system consists of approximately 13.4 miles of gravel road, starting from Young Bay leading north to Hawk Inlet junction which encompasses five miles, then proceeding to the mine complex at another 8.4 miles encompassing 13.4 miles.

Any and all work that is related to widening, tree removal, guard railing, etc., must have prior approval by the Forest Service.

Forest Service Phone Numbers

Admiralty National Monument:	(907) 586-8790
Dispatch (Sitka)	(907) 747-5611

Burning of any material, requires planning, burn permitting, and preventative burn measures such as water supply and fire watch.

In the event of wild fires, GCMC will:

- Immediately fight the fire, with needed personnel to keep fire(s) under control.
- Greens Creek will keep a watchperson on the Island during night and weekend hours to check on live fires.
- Notify the Forest Service as soon as possible.
- Continue fighting the fire until it is out or until released by the Forest Service.

When the Forest Service arrives on scene, Forest Service will assume responsibilities as incident commander and GCMC will respond accordingly.

Forest Service will:

- Dispatch additional manpower and equipment needed.
- Take charge for the direction of firefighting if Forest service resources are committed to the fire.
- Ensure that a 12 foot wide radius fire line has been constructed around the pile prior to burning.

Greens Creek will have equipment available and in good serviceable condition, which will be maintained at a location that is accessible to operations. Equipment will be tested periodically as may be required by the Forest Officer in charge.

Prior to any burning commencing, Greens Creek will check with the Forest Service Officer in charge for clearance. The Forest Service will notify Greens Creek Mining Company if burning is to be stopped due to weather conditions.

Any gasoline powered saw will be provided with a muffler in good working condition. Greens

Creek will ensure that the approved spark arrester is in the muffler, and the saw operator will inspect the spark arrester during dry conditions. ABC fire extinguisher no less than 20 pounds will be located strategically in the unlikely event of a fire.

If work is to be scheduled during critical dry season additional precautions will be taken, such as larger amounts of extinguishing agents, shovels and possibly a fire watch.

Any surface refueling will be tasked in clear areas, if gasoline powered saws are refueled they shall be moved at least 50 feet prior to restarting.

Disposal of slash and debris by burning will require a tank truck or trailer of not less than 300 gallons be present during burning, unless weather conditions suffice as ample protection.

Tank trucks will be equipped with various tools and equipment to aid in firefighting.

Post a copy of this plan in a conspicuous place so that Greens Creek and contract employees are aware of the provisions and their responsibilities stated within.