

HEALTH & SAFETY STANDARDS

Explosive Handling and Blasting

Effective Date: 02/16/10

Standard: 16.24

Document Number: KUCSH00034

Rev: 05

16.24.1 **INTRODUCTION**

16.24.1.1 This standard applies to the handling and use of all explosives and blasting agents (ANFO) used in operations at Kennecott Utah Copper and serves a written "Certification Application of Explosive Standards" (MSHA 30 CFR 56) as well as 18 U.S.C. 841, and 27 CFR 55.

16.24.1.2 The purpose of this standard is to outline practices for the safe storage and use of explosives and blasting agents. This standard is comprised of a general requirements section which details explosive storage and transportation requirements for all plants and two separate sections which details specific procedures and practices at the Bingham Canyon Mine, and the Smelter Plant

16.24.2 **REQUIREMENTS**

16.24.2.1 All explosives will be stored in approved storage magazines designed to the appropriate regulatory agency specifications. All explosives and blasting agents shall be stored in a manner that meets (or exceeds) standard requirements of ATF (Bureau of Alcohol, Tobacco and Firearms) and MSHA. Storage of explosives and blasting agents shall also meet State and Company standards including:

- Separate magazines of approved construction shall be provided for the storage of explosives and detonators.
- All storage magazines shall be double locked (each with two different locks). Each shall be covered with a metal security box to protect the lock from weather and / or vandalism.
- Access to storage magazines shall be strictly controlled. The delivery, removal, and return of explosives, primers, etc shall be documented.
- Storage magazines shall be properly grounded, ventilated, and the area around the magazines shall be kept free of vegetation and other combustible materials for a minimum distance of 25 feet.
- The interior of the magazines will be kept clean, dry, organized, and free of all extraneous material.
- No open flame or other sources of ignition or volatile material is permitted within 50 feet of the storage magazines.
- Repairs to the magazines are not permitted when explosives are contained in the magazines.
- The perimeter and entrance to the storage area will be

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posted with "Danger, Explosives Storage Area" signs.

- 16.24.2.2 Explosives will be transported in accordance with ATF regulations, which require Class 1.1 (Explosives with a mass explosion hazard) explosives be transported in approved nonconductive containers and be transported in a separate vehicle from that of Class 1.4 (Explosives with no significant blast hazard) explosives. Explosives can be transported in the same vehicle (bed of truck) if a box of 4" hardwood or the equivalent be prepared with two compartments separating the explosives by class. The construction of the transport box must be in compliance with ATF regulations.
- Persons driving the vehicle containing explosives must be trained for the task. The explosives are to be transported directly to the delivery point from the magazines over routes calculated to expose a minimum number of people. Similarly, explosives to be returned to the magazines are to be transported the most direct route and immediately returned.
 - No metal tools, carbides, oils, matches, firearms, electric storage batteries, flammable substances, acids, or oxidizing or corrosive compounds shall be carried in the bed or body of any vehicle transporting explosives. Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives, detonating cord, or detonators, except for safety fuse and properly secured, non-sparking equipment used expressly in the handling of such explosives, detonating cord, or detonators.
 - The number of employee(s) involved in the transportation and use of explosives shall be limited to the least number of people required to perform those tasks.
 - No employee shall smoke while transporting or handling explosives or detonators. Smoking or open flames are prohibited within 25 feet of explosives or detonator.
 - Vehicles used in the transportation of explosives and detonators shall be operated in accordance with established safe-operating practices. Vehicles shall be well maintained and in good operating condition.
 - When vehicles containing explosives or detonators are parked, the brakes shall be set, the motor shut off, and the vehicles shall be blocked securely against rolling. The vehicles shall not be left unattended except in blasting areas where loading or charging is in progress.
 - Only vehicles specifically equipped shall be used for the transport of detonators and explosives. Vehicles shall be

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properly placarded.

- Vehicles containing explosives shall not be taken into a shop.
- Vehicles transporting explosives must be equipped with a minimum of two fire extinguishers.

16.24.3 **REQUIREMENTS - BINGHAM CANYON MINE**

16.24.3.1 All persons conducting loading and blasting must be properly task trained under the direction of the Blasting Supervisor. All task training will be properly documented on a MSHA 5000-23 Certificate of Training Form.

16.24.3.2 Once priming and loading operations have commenced only employee(s) engaged in those operations should enter the loading site unless cleared by the Blasting Supervisor or his designate.

- No equipment other than that involved in loading operations shall come within 50 feet of primed or loaded blast holes.
- Loading activities shall be suspended during lightning storms, and the blast site must be cleared of all personnel.
- All blasting shall take place during the daylight hours.
- Blasting sites shall be properly guarded and signs identifying the blast area shall be posted.

16.24.3.3 Proper precautions shall be taken to ensure that employee(s) and equipment are moved to a safe distance from the blast.

- Notification of a pending blast shall be made on all radio channels.
- Immediately prior to the blast "radio courtesy" shall be called for on designated channel.
- Once radio courtesy has been established, the Blast Supervisor or his designate shall ensure, once more, that the area is clear.
- Upon confirmation that the area is clear, the Blasting Supervisor shall notify all personnel of the pending blast and its location. This notification shall be followed by 20 seconds of warbling siren, followed by four long blasts of same siren.
- Unless notified by one of the blocking personnel that it is not clear to blast, the blaster shall detonate the shot upon completion of the siren blasts.

16.24.3.4 After the blast has been detonated and the Blaster has determined that all is clear, he shall broadcast on all radio channels that the blast is completed and radio courtesy is clear on designated channel.

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- No one shall re-enter the blasting area until all smoke, dust, and fumes have dissipated.
- After the blast has been cleared, the Blasting Supervisor or his designate shall conduct a thorough inspection of the blast area; during the inspection, the Blaster shall look for undetonated explosives or explosives burning in a blast hole.
- If the blaster suspects explosives burning in a hole, all employee(s) in the area shall be moved to a safe location and not return to the hole for at least one hour.

16.24.3.5 Any time a misfire is located or suspected the Blasting Supervisor shall be notified and proper precautions shall be taken in the disposal of the misfire as indicated below.

- No employee shall enter the blasting area for at least 15 minutes after any misfire.
- Never drill a hole where there is a danger of intersecting a charge or a missed hole.

16.24.3.6 When a suspected misfired blast hole is found in the shovel face, the following procedure shall be followed:

- Personnel qualified up to a Blaster III level (qualified person) shall assess the situation and oversee remediation of the hazard.
- Shovel operation will be suspended until the qualified personnel can inspect the suspected misfire. If there is sufficient room to work around the misfire, a minimum distance of 50 feet shall be maintained from the misfired hole.
- When a misfired blast hole is confirmed, it shall be reported to the Operations Superintendent or his designate.
- When cords are present a qualified individual shall:
 - Attempt to remove the boosters from the explosive column.
 - Attempt to wash the blasting agent from the hole with the water truck, if the cords are not readily removable.
 - If there is sufficient burden, the missed hole may be blasted; however, extreme caution must be exercised to avoid injury or damage from fly rock.
 - If the boosters cannot be recovered by washing and cannot be safely blasted, must be dug out with a shovel. This is an extremely critical operation, and all precautions must be taken to avoid accidental detonation.

16.24.4 **REQUIREMENTS - SMELTER PLANT**

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- 16.24.4.1 Only personnel that have completed the designated Smelter Explosives Training Program and have been approved by the Hot Metals Superintendent may have access into powder magazines for removal of explosives. The security department will unlock each magazine at the request of the Blasters or Hot Metals Superintendent.
- 16.24.4.2 An audit of the usage and current inventory of the explosive materials will be conducted quarterly by the Hot Metals Superintendent. The Bureau of Alcohol Tobacco and Firearms is to be immediately contacted if explosives are determined as lost or stolen. Additionally, the KUC Security Director must be notified in order to contact the Department of Homeland Security.
- 16.24.4.3 To initiate the procedure for obtaining explosives for blasting, the approved Blaster is to contact security and make the request from the Security Supervisor in charge on the shift. The Security Supervisor will report to and remain at the storage facility until the transfer is complete, each magazine is locked, and the gate locked. It is not the responsibility of security personnel to inventory the explosives. This is the responsibility of the approved Blaster.
- 16.24.4.4 Only one storage magazine is to be opened at a time. Upon removing explosives from the magazine, the explosives are to be placed immediately into the "Day Boxes" for transport. The explosives are to be kept in the "Day Boxes" until used. The "Day Boxes" are to be in the presence of the Blaster or his designated helper at all times. Only authorized persons are to handle, transport or perform other tasks with explosives.
- 16.24.4.5 All blasting will be performed under the direct control of an approved Blaster and will conform to all State and Federal regulations and the KUC Smelter Explosive Safety Program.
- 16.24.4.6 The standard practices for High Temperature Blasting are defined in the KUC Smelter Explosive Safety Program. Procedures have been prepared for blasting in the Flash Smelting Furnace and Flash Converting Furnace Waste Heat Boilers and the ESPs. Variance from these procedures is prohibited unless the procedures are modified and approved by the Hot Metals Superintendent Facility Safety, and the Plant Manager.
- 16.24.5 **RESPONSIBILITIES**
- 16.24.5.1 The Blasting Supervisor is responsible to ensure that all personnel

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assisting the blasting have been properly trained and the blasting standard and procedures are followed at the blast site including:

- Ensuring that the blasting site is properly guarded and signs identifying the blast area are posted.
- Notifying personnel of the pending blast and its location.
- Ensuring that the area is clear prior to the blast and conducting a thorough inspection of the blast area following the blast.

- 16.24.5.2 A qualified blasting supervisor is responsible for locking / unlocking each magazine. At no time will the explosive magazine keys be removed from KUC property.
- 16.24.5.3 If it is determined, that explosives have been stolen or lost, the responsible Superintendent shall contact the Area Manager and inform them of the requirement of reporting the incident to the Federal Bureau of Alcohol Tobacco and Firearms, MSHA / OSHA and DHS. An investigation report will be completed.
- 16.24.5.4 It is the responsibility of the Blaster to ensure that inventory documents are properly completed and signed when removing or adding to the magazine inventory.
- 16.24.6 **RECORDKEEPING**
- 16.24.6.1 Copies of the Explosives Use and Storage Permit will be posted inside each magazine visible to persons opening the magazines.
- 16.24.6.2 Current inventory documents will be maintained in each magazine. All explosive materials removed from or added to the magazines will be indicated on inventory sheets. The signature of the approved person removing or adding to the inventory is required at the time of the adjustment.

REFERENCES:

Department of Homeland Security 6 CFR §27, et seq
 MSHA 30 CFR § 56, et seq.
 U.S.C. §841, et seq. and 27 CFR §55, et seq.
 KUC Smelter Explosives Safety Program

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11428	Scheduled review and update also updated format and Document number added.	KUC Safety and Health Standards Committee	02/10