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Outgoing
c/007/0013

From: Daron Haddock
To: Joe Helfrich; OGMCOAL
Date: 1/22/2009 11:34 AM
Subject: Fwd: Estimated ground vibration at eagle nest located 1/4 mile from rock slope
Place: OGMCOAL

>>> Pete Hess 1/15/2009 9:18 AM >>>
Jay...

Here is some information which you might find beneficial in the future.

Based on the discussion with the DNR/DWR, the BLM and the DOGM, I have discussed the ground vibration issue at the eagle nest with Mr. C.W. Bradley of Bradley Safety Consultants / Wilburton, Oklahoma. Mr. Bradley is a recognized authority on blasting, use of explosives, blast monitoring (i.e., ground vibration and air blast), blasting safety, etc., etc.

He has trained BATF, FBI, and other government agencies in the investigation of bomb / terroism activities, and in general is a recognized authority on explosives.

Here is what we have determined:

Based upon your submitted blasting plan, utilizing 45 holes @ six pounds of explosive per hole, and a maximum of seven holes per 8 millisecond delay (OSM standard) (42 pounds of explosive per delay (maximum)),

the estimated peak particle velocity at the eagle nest can be calculated by the following formula;

160(Distance to the Monitoring Point/ the Square Root of the Powder Weight / 8 MS delay Period) to the - power of 1.6 =

160(1320 feet / square root of 42 pounds) to the negative (-) power of 1.6 = 160 (203.6) to the negative 1.6 = 0.032 inches per second. A distance of 1/4 mile is used.

The actual scale distance factor is determined by dividing the distance (1320 feet) by the square root of the powder weight = 1320 feet / 6.48 = 203.7.

The time duration of the ignition of the 42 pounds of explosives is estimated at 125 milliseconds, or 1/6 of a second.

The ground vibration of 0.032 inches per second on the raptor eggs in the nest **is less than the effect that wind would have on the nest or from the turbulents created by the flapping wings of the parent eagle upon landing.**

Hope this helps...