

# THE AUSTIN ADVANTAGE

BULK EMULSION UNDERGROUND  
DECREASES NOX BY 80%

## GENERAL INFORMATION

**Location:** Austin Powder MidSouth LLC

**Project type:** Underground

**Industry:** Limestone sloping/development and production

**Products Used:**

- Hydromite 4100
- ShockStar detonators
- DC cast boosters (Diamond Nuggets)

**Outcome:** NOx Reduction

## THE HISTORY

Historically, this quarry has a moderately wet environment. The site has an established surface quarry and had just started with underground development at the beginning of the Red Devil trials. By partnering with this customer, Austin Powder was able to test the Red Devil and chemically sensitized emulsion underground for the first time in the United States. Through extensive work between Austin Powder, the customer, and the regulatory authorities, the mine was granted a variance from CFR 30, 57.6960 to “mix” explosive material underground.

## THE GOALS

1. Work with the customer to receive a variance from CFR 30, 57.6960 to produce chemically sensitized bulk Hydromite 4100 underground with a bulk loading unit, in this case, the Red Devil.
2. Display the benefits of bulk emulsion as compared to the drawbacks of bulk ANFO and packaged emulsion in wet environments underground.
3. Provide the customer with another option when it comes to selecting an explosive product that fulfills their needs, while considering the various working environments our customer can encounter.
4. Work with Austin Powder Germany GmbH, the developers of the Red Devil, to gain familiarity with the unit in the US.
5. Quantify the reduction in NO and NO2 in post-blast fumes when using bulk emulsions versus bulk ANFO.



## CUSTOMER CHALLENGE

The process of working with authorities for approval of the variance took many months. By diligently working together, Austin Powder and the customer were able to represent chemically sensitized emulsions and the Red Devil with accurate safety considerations to allow authorities to grant the variance to the mine. This is, to our knowledge, the first time that this variance has been granted for chemically sensitized emulsions.

Prior to the trials, the European-developed Red Devil was not used in the United States. The challenge of working with a new system was mitigated by working closely with the developers, Austin Powder GmbH. With help from Austin Powder US and Austin Powder Germany, the customer saw no downtime resulting from ordering/shipping parts or troubleshooting from Europe.

## THE AUSTIN SOLUTION

Provided the customer with a new option for their underground explosives selection. In over 25 blasts, the customer used 25,000lbs of bulk chemically sensitized emulsion to mitigate the effects of water in boreholes while maintaining the fragmentation and underground advance standards they had when using bulk ANFO and packaged emulsion. Austin Powder's underground chemically sensitized bulk delivery unit, known as the Red Devil, made its first quantities of chemically sensitized emulsion in the United States during these trials. The customer was pleased with the load efficiency and effectiveness of the Red Devil unit, the need for only one product for wet and dry conditions, and the benefits for on-site storage of bulk emulsion oxidizer versus bulk blasting agent. The change in bulk product and bulk loading equipment provided the benefits of both products. By combining these benefits along with maintaining post-blast quality, the customer was very happy with the trials and will keep this technology in mind for future cases.

## THE OUTCOME

Over 25 successful blasts utilizing over 25,000lbs of bulk Hydromite 4100 emulsion. The Red Devil is a viable unit, as is chemically sensitized emulsion for underground conditions. These are two added "tools" to be used in the various mine conditions encountered across the US.

Post-blast fume monitoring showed a significant decrease in peak NO and NO2 fume concentrations. For NO, the reduction was close to 80%, while NO2 reduction was close to 70%.

The customer is aware of the new tools they have been introduced to and may choose to use these tools in future operations where there is compatibility between the operation, the Red Devil, and chemically sensitized emulsions.

