

PRELIMINARY CONTROL TECHNOLOGY ASSESSMENT

OF

Day Mines, Inc.  
Leadville, Colorado

SURVEY CONDUCTED BY:

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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
Division of Physical Sciences and Engineering  
Engineering Control Technology Branch  
4676 Columbia Parkway  
Cincinnati, Ohio 45226

PURPOSE OF SURVEY: To investigate Day Mines's methods of controlling potential health hazards in the beneficiation of lead ore and to determine the advisability of conducting an in-depth survey of this plant.

EMPLOYER REPRESENTATIVES

CONTACTED: Ralph Noyes, Unit Manager  
Frank Cutrone, Maintenance Foreman  
Earl Wagner, Mill Superintendent

EMPLOYEE REPRESENTATIVES

CONTACTED: None

STANDARD INDUSTRIAL CLASSIFICATION

CODE OF PLANT: 1031

## INTRODUCTION

The Engineering Control Technology Branch of the Division of Physical Sciences and Engineering, NIOSH, is conducting a research study to assess and document control methods for minimizing worker exposure to harmful substances, operations, and processes in the beneficiation of galena and cerussite (lead) ore industry. Exposure to a number of substances used in the beneficiation of lead ore may lead to a variety of health problems. These substances include lead, silica, nuisance dusts, and flotation reagents.

This preliminary survey was conducted to obtain information on control technology used in the industry including engineering controls, monitoring devices, work practices and protective equipment, and to determine the advisability of conducting an in-depth survey of this plant.

## PLANT DESCRIPTION

Lead ore beneficiation production began at the Day Mine's Leadville Mill operation in 1973. Approximately 400 tons of crude ore, averaging about one-half percent lead, is processed per day. The mill operates seven days per week, 24 hours per day, to produce silver and lead concentrates. The company employs approximately 21 persons at their Leadville operation with 5 in the mill.

## PROCESS DESCRIPTION

The above-ground concentrator process begins at the crushing facility consisting of a grizzly, primary jaw crusher, and secondary gyro crusher which reduce the ore to minus 5/16 inch. A continuous belt conveyor carries the ore to the concentrator fine ore storage bin. From the storage bin, ore is proportionally mixed with water and fed into the grinding circuit, where it is ground by a Denver 5 x 10 foot ball mill in closed circuit with hydrocyclone classifiers. The flotation feed pulp is conditioned by



automatically controlled reagent additions and processed through the lead recovery flotation circuit. The resultant tailings are then fed through a Reichert spiral wet gravity separator for further concentrate recovery. The concentrate from each circuit flows out to a 20 foot diameter thickener tank where the pulp is thickened to 70% solids and pumped to a filter and dryer. The filtered dewatered concentrate is then stored in loading bins until it can be loaded out in measured lots for haulage by contract truck to the smelter.

#### HEALTH AND SAFETY PROGRAM

The health and safety program is conducted by the Maintenance Foreman who conducts periodic inspections of the facilities. A good housekeeping program consists of washing down spills and residual dust as necessary to maintain work area floors in reasonably clean condition. A formal MSHA-required health and safety training program is conducted by contract personnel.

#### CONTROLS

There are no specific engineering controls employed in this operation, such as ventilation systems and flotation cell covers, other than rubber lining in the ball mill.

#### CONCLUSIONS/RECOMMENDATIONS

The Day Mines, Inc., Leadville, Colorado is not recommended for an in-depth study since it does not have any sufficiently unique state-of-the-art controls not found in other concentrators previously recommended for study.