

PRELIMINARY CONTROL TECHNOLOGY ASSESSMENT

OF

Standard Metals Corporation  
Silverton, 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 Standard Metal'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: Albert Thaxton - Safety Supervisor  
Barbara Morris - Assistant Safety Supervisor  
Richard Gibson - Mill Superintendent  
Eric Olin - Metallurgist

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 Standard Metals Silverton operation in 1929. Approximately 1,000 tons of crude ore, averaging between four and five percent lead, is processed per day. The mill operates five days per week, 24 hours per day, to produce gold, silver, lead, zinc, and copper concentrates. The company employs approximately 230 persons at their Silverton operation with 45 in the mill.

## PROCESS DESCRIPTION

The beneficiation process is located in one general building. The average through put is 1000 tons per day. The mine ore is hauled by truck and dumped into a coarse ore bin. The ore is reduced to minus 3 inch in a jaw crusher and further reduced to minus 3/4 inch in two cone crushers. The ore is stored in a 1000 ton capacity fine ore bin. From the ore bin, the rock is further comminuted in a 6 x 12 foot rod mill, passed through a 54 inch spiral classifier into a cyclone feed jump. The underflow goes to a steel-lined ball

mill which discharges onto a Denver mineral jig. The jig, using gravity separation, separates the gold with the remainder of the material being dewatered (in a cyclone) and the solids pumped to the tailings pond. The overflow from the cyclone feed sump goes to the lead flotation circuit where both lead and copper are floated off as a concentrate (50% lead, and 6 to 8% copper). The tailing goes through the zinc flotation circuit to yield a zinc concentrate. The tailings from the zinc circuit is dewatered (cyclone) and pumped to the tailings pond. Calcium hypochlorate is added to the liquer to destroy the sodium cyanide before being allowed to overflow into the river.

#### HEALTH AND SAFETY PROGRAM

The health and safety program is conducted by the Safety Supervisor and staff who conducts periodic inspections of the facilities including quarterly environmental sampling. 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 Company personnel.

#### CONTROLS

There are no specific engineering controls employed in this operation, such as ventilation systems and flotation cell covers. Respirators and other personal protective equipment are used extensively throughout the operation.

#### CONCLUSIONS/RECOMMENDATIONS

The Standard Metals Corporation Silverton Mill, 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.