MAI-2004-24

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

Report of Investigation

Surface Nonmetal Mine
(Sand and Gravel)

Fatal Fall of Highwall Accident
December 6, 2004

Kuhl Sand & Gravel, Inc.
Kuhl Sand & Gravel, Inc.
Erie, Erie County, Pennsylvania
Mine ID No. 36-07715

Investigators

Donald L. Ratliff
Mine Safety and Health Inspector

Robert L. Carter
Supervisory Mine Safety and Health Inspector

Stanley J. Michalek, P.E.
Supervisory Civil Engineer

Stanley T. Schaeffer, Jr.
Civil Engineer

Originating Office
Mine Safety and Health Administration
Northeast District
Thorn Hill Industrial Park
547 Keystone Drive, Suite 400
Warrendale, PA 15086-7573
James R. Petrie, District Manager

OVERVIEW

On December 6, 2004, Donald D. Kuhl, president, age 51, was fatally injured when he was trapped in the cab of a front-end loader by falling material. The victim was operating a front-end loader digging material near the base of a 65 foot highwall when approximately 445 tons of sand and gravel material fell off the highwall and partially buried the loader.

The accident occurred because the mine operator did not ensure that mining methods used maintained the stability of the highwall. Mining was being conducted at the base of a near vertical, 65 feet highwall that was not benched or sloped to the angle of repose. The mine operator had been cited on several previous occasions for failing to utilize safe mining methods in this same area.

GENERAL INFORMATION

Kuhl Sand & Gravel Inc., a surface sand and gravel operation, owned and operated by Kuhl Sand & Gravel, Inc. was located near Erie, Erie County, Pennsylvania. The principal operating official was Donald D. Kuhl, president (victim). The mine operated one 8-hour shift per day, five days a week. The mine employed four persons.

Sand and gravel was mined by using a dozer to strip the overburden and an excavator to mine the top portion of the highwall. The excavator cast the material to the base of the highwall. A front-end loader loaded the material into trucks that transported it to the plant for screening, sizing, and stockpiling. The finished products were sold for use in the construction industry.

The last regular inspection of this operation was completed on May 4, 2004.

DESCRIPTION OF ACCIDENT

On the day of the accident, Donald Kuhl, (victim), reported to work at 7:15 a.m. His regular duties included supervising employees and operating the plant. Donald Kuhl met with James W. Kuhl, laborer (victim's son), and Michael A. Huzinec, laborer, to review the work schedule and assign jobs. Donald Kuhl and James Kuhl prepared the plant for production while Huzinec traveled to the #3 pit to start the excavator.

Donald Kuhl met with Walter W. Kuhl, vice-president (victim's father), to discuss the day's activities and to make preparations for shutting down the operation for the winter. Huzinec told Donald Kuhl that the excavator would not start so they went to the pit but could not get the excavator started.

About 9:30 a.m., Huzinec returned to the shop to assist James Kuhl with truck repairs. Donald Kuhl drove a haul truck to the #3 pit and used a front-end loader to load material from the base of the highwall into the truck. He hauled three or four loads of material from the pit to the plant before stopping for lunch at approximately 12:00 p.m. After lunch, Donald Kuhl rewired a pump pressure switch and worked on the plant. About 2:00 p.m., the plant was started and Donald Kuhl resumed hauling material from the #3 pit to the plant.

At 4:30 p.m., Huzinec and James Kuhl noticed that Donald Kuhl had not returned from the pit. Huzinec went to the pit and discovered that the highwall had collapsed and partially covered the front-end loader. Huzinec thought that Donald Kuhl was trapped inside the cab and phoned James Kuhl at the shop and called for emergency assistance. When James Kuhl arrived, he attempted to remove the material that had engulfed his father who was non-responsive.

At 4:53 p.m., emergency personnel arrived and immediately pronounced Donald Kuhl dead at the scene. A decision was made to move the front-end loader away from the dangerous highwall before trying to recover the victim. An excavator removed material from around the covered front-end loader and a dozer pulled the loader away from the base of the highwall to a safe location. The victim was removed from the cab at about 1:30 a.m. on December 7. Death was attributed to compressional asphyxiation.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at approximately 5:45 p.m. on December 6, 2004, by a telephone call from Don Erbin, fire chief, Kuhl Hose Fire Department, to James Petrie, district manager. An investigation was started the same day. An order was issued pursuant to Section 103(k) of the Mine Act to ensure the safety of the miners.

MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident site, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine employees, Kuhl Hose Fire Department, Pennsylvania State Police, Pennsylvania Department of Environmental Protection, and the Erie County Coroner's office.

DISCUSSION

Location of the Accident

The accident occurred at the base of the south highwall, located in the #3 pit. The #3 pit was a horseshoe shaped excavation into a hillside composed of sedimentary deposits of sand and gravel. The highwall was comprised of sand and gravel with clay and silt mixed in the top 20 feet of the seam. The wall was approximately 65 feet high and was standing at an angle of 80 to 87 degrees. The portion of the wall that fell was approximately 45 feet high, 8 feet deep, and 50 feet wide. The volume was calculated at approximately 8,100 cubic feet and weighed approximately 445 tons.

A review of MSHA's inspection records showed that this mine operator had been cited on four separate occasions between April of 2001 and August of 2004 for the failure to utilize mining methods that would maintain the stability of the highwall in the #3 pit.

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Weather

The weather conditions on the day of the accident were cold, wet, and cloudy, with temperatures ranging from 27 to 51 degrees Fahrenheit. During the week preceding the accident, Erie, Pennsylvania had received approximately 0.80

inches of rain, with 0.42 inches of rain falling five days prior to the accident. On the day of the accident, 0.07 inches of rain was recorded.

Equipment

The front-end loader involved in the accident was a Caterpillar Model 988A. The loader was equipped with a roll-over protective structure (ROPS) and a seat belt. As a result of the accident, the three front windows of the loader dislodged and were found inside the operator's compartment. Both side doors on the loader were in the fully open position. Material was piled on both sides of the loader and had filled the cab.

Training and Experience

Donald Kuhl had 25 years mining experience, all at this mine. He had received training in accordance with 30 CFR, Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following causal factor was identified:

Causal Factor: Management policies and controls were inadequate and failed to implement mining methods that would maintain highwall stability in the #3 pit where persons worked. The berm and warning sign that were erected to prevent access to the pit, along with obvious hazardous ground conditions, were ignored and the operator continued to remove material from near the base of the unstable highwall. MSHA regulations and recommendations were also repeatedly ignored, along with recommendations on safe mining methods from the mine operator's own consultant.

Corrective Action: Mining methods should be established that will maintain highwall stability to ensure the safety of persons assigned to work near the base of the highwalls.

CONCLUSION

The accident occurred because the mine operator did not implement mining methods to maintain the stability of the highwall. Mining was conducted at the base of a near vertical, 65 feet highwall that was comprised of consolidated sand and gravel. The highwall was not benched or sloped to the angle of repose. The mine operator had been cited on several previous occasions for failing to utilize mining methods that would maintain highwall stability. As a result of previous violations issued regarding the highwall in the #3 pit, a berm to restrict access had been constructed at the entrance and a sign stating "Danger Open Pit" had

been installed at the berm. The sign and berm were removed to conduct mining activities at the base of the hazardous highwall.

ENFORCEMENT ACTIONS

Order No. 6021118 was issued on December 6, 2004, under the provisions of Section 103(k) of the Mine Act:

> A fatal accident occurred at this operation on December 6, 2004, when material on the South highwall of the #3 pit failed. The material partially covered the Cat 988A front end loader that was operating at the base of the highwall. This order is issued to assure the safety of all persons at the operation. It prohibits all activity at the #3 pit until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and restore operations in the affected area.

Order No. 6026012 was issued on December 16, 2004, under the provisions of Section 104(d)2 of the Mine Act for violation of 56.3130:

> A fatal accident occurred at this mine on December 6, 2004, when the company president was entrapped inside the cab of a front-end loader. He was removing material from the base of a highwall when it collapsed, partially burying the loader. The highwall was approximately 65 feet high, near vertical, and was comprised of consolidated sand and gravel. The mine operator had not utilized mining methods to maintain the stability of the highwall. MSHA had cited the mine operator for violations of this standard on April 26, 2001, July 28, 2003, November 19, 2003, and August 3, 2004. The last three violations were issued as unwarrantable failures to comply with a mandatory standard. Other company officials had been informed of these violations and knew of the hazards. The operator had erected an earthen barricade to restrict access to this highwall as his choice to terminate the most recent violation. The mine operator engaged in aggravated conduct constituting unwarrantable failure to comply with mandatory standard 56.3130, when he purposely breached the barricade and removed material from the base of the highwall without first taking actions to ensure the stability of this highwall.

Approved by: _____ **Date: January 18, 2005**

James R. Petrie
District Manager

APPENDIX A

Persons Participating in the Investigation

Kuhl Sand & Gravel, Inc.

James W. Kuhl	mechanic & victim's son
Jolyda O. Swaim	sister-in-law of victim
Michael A. Huzinec	laborer
Walter W. Kuhl	vice-president & victim's father

Kuhl Hose Fire Department

Donald S. Erbins, Jr	fire chief

Pennsylvania Department of Environmental Protection

John S. Sims	surface mine conservation inspector supervisor
Arnold N. Belz	surface mine conservation inspector
T.M. VanDyke	inspector supervisor

Pennsylvania State Police

Mark A. Van Horn	trooper
Mark G Lugin	trooper

Erie County Coroner's Office

Lyell P. Cook	coroner

Mine Safety and Health Administration

Donald L. Ratliff	mine safety and health inspector
Robert L. Carter	supervisory mine safety and health inspector
Richard E. Burkley	mine safety and health inspector
Dale Dinning	mine safety and health inspector
Stanley J. Michalek	supervisory civil engineer
Stanley T. Schaeffer, Jr.	civil engineer