

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

REPORT OF INVESTIGATION

Surface Nonmetal Mine  
(Limestone)

Fatal Falling Material Accident

October 7, 2008

Hummelstown Quarry  
Pennsy Supply Inc.  
Hummelstown, Dauphin County, Pennsylvania  
Mine I. D. No. 36-04291

Investigators

Thomas J. Shilling  
Mine Safety and Health Inspector

James R. Slick  
Mine Safety and Health Inspector

Dale P. Ingold, PE  
General Engineer

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



**Chute in surge tunnel below primary surge pile**



**Removal of surge pile over feeder during recovery**

## **OVERVIEW**

Larry R. Trimmer, maintenance lead man, age 56, was fatally injured on October 7, 2008, when he was engulfed in a chute in an underground surge tunnel. He was working below the feeder hopper when material fell from the primary surge pile.

The accident occurred because management policies, procedures, and controls did not ensure that persons could safely perform maintenance tasks in the surge tunnel. The victim entered the chute under the feeder hopper to perform maintenance but adequate measures had not been taken to assure that material from the primary surge pile did not fall into the chute.

## **GENERAL INFORMATION**

Hummelstown Quarry, a surface limestone operation, owned and operated by Pennsy Supply Inc., was located in Hummelstown, Dauphin County, Pennsylvania. The principal operating official was Larry E. Stine, superintendent. The mine operated one 10-hour shift, four days per week. Total employment was 19 persons.

Limestone was blasted from multiple benches, loaded into haul trucks by front-end loaders, and transported to the surface plant where it was crushed and sized. Finished products were sold to the construction industry.

The last regular inspection at this operation was completed on April 22, 2008.

## **DESCRIPTION OF ACCIDENT**

On the day of the accident, Larry R. Trimmer (victim) reported for work at 6:30 a.m., his normal starting time. Larry E. Stine, superintendent, presented a tool box talk for all employees and then assigned tasks to everyone. Afterward, Trimmer performed his assigned maintenance duties.

About 8:05 a.m., Gerald A. Evans, secondary plant operator, noticed the feeder in the surge tunnel contained too many fines. This situation was referred to as “free flowing.” Evans called Stine on the radio to report the problem and then went into the surge tunnel to check the feeder. Stine went to the plant and noticed stone was still coming out of the surge tunnel on the belt conveyor (No. 1 belt). Evans told Stine that nothing was broken on the feeder and he was returning to the control room to check on the other belt conveyors.

Stine entered the surge tunnel to determine how to correct the problem with the feeder. Shortly after, Evans noticed the No. 1 belt shut off and the console lights indicated another belt conveyor (No. 136 belt) was not operating. Stine called Scott M. Stahle, maintenance superintendent, on his cell phone to discuss the problem with the free flowing feeder.

Stine came out of the surge tunnel and gave Trimmer his phone to talk to Stahle. Stahle then told Trimmer how to repair the feeder. Stahle said a restrictor plate (used to regulate flow of material) should be placed in front of the feeder. Evans went to the entrance of the surge tunnel and told Stine the belt conveyor going to the mill had stalled and he would check the counterweight for the No. 136 belt. Stine left Trimmer to address these additional problems.

Trimmer and Joseph A. Newsome, haul truck driver, entered the surge tunnel. Trimmer decided to install the restrictor plate at a different location in the feeder chute than was originally planned. Trimmer crawled onto the belt conveyor, leaned into the chute from the front, and took a measurement. Trimmer then left the tunnel to cut a metal plate to complete the repairs. After receiving instructions from Stine, Newsome left Trimmer to drive his truck under the secondary 2A bin to empty it.

Evans started the belt conveyors including the No. 1 belt and the feeder. The gauges in the secondary control room indicated that the No. 1 belt was empty. The rheostat for the feeder was turned to 100 percent and the feeder was turned on and off five or six times. At that point, Evans thought that the feeder was empty or “day lighted” because he heard a hollow sound. The No. 1 belt and feeder were then shut down.

Trimmer obtained the materials needed to install the restrictor plate and returned to the office to retrieve his glasses. Stine drove Trimmer back to the surge tunnel and instructed him not to enter the feeder unless the pile was moved back away from the No. 1 belt feeder hopper inlet (“ringed”). Evans, Newsome, and Trimmer, locked out and tagged the power for the No. 1 belt and took the restrictor plate and additional pieces of angle iron into the surge tunnel to modify the feeder.

Trimmer told them he was going to install a restrictor plate in the chute and cut it to adjust the flow as needed. Trimmer welded two pieces of steel angle horizontally to the side walls of the chute from the belt side of the hopper gate. He then placed the 16-inch by 31-inch by ¼-inch steel plate, which he had previously cut, on the steel angles and attempted to force it in place. However, he could not move the plate to a vertical position. Trimmer then crawled into the feeder hopper under the steel plate. Apparently, he wanted to see what was preventing the plate from rotating to the vertical position. Although the feeder hopper had been “day lighted”, a cone of steeply angled material from the primary surge pile remained around the opening.

Trimmer determined that another piece of angle needed to be cut and installed. Evans handed Trimmer a tape measure and asked if the front of the feeder needed to be raised to adjust the flow rather than installing the plate. About 10:20 a.m., Trimmer continued to take measurements inside the hopper when a small amount of stone fell causing Evans to jump back. Shortly after that, a large amount of stone fell engulfing Trimmer.

Evans and Newsome attempted to free Trimmer but material kept falling around them. The stone was too large to shovel so they dug with their hands. Evans ran outside and shouted for help. George E. Jumper, water truck driver, responded and radioed for Stine. Stine and Robert L. Olsen, fine grind plant supervisor, entered the tunnel to help dig. Stine ran out of the tunnel to call on his cell phone for emergency assistance. Jumper, Don E. Halblieb and William Shaffer, loader operators, entered the tunnel to assist in the digging. Due to the size of the stones surrounding Trimmer, all digging by rescuers was performed by hand. About 10:30 a.m., emergency medical services and numerous fire department personnel arrived at the mine and took over the rescue operations. For about one hour, they unsuccessfully tried to remove Trimmer from the chute but their efforts were sporadically interrupted by additional falling material. At 11:35 a.m., an emergency medical technician pronounced Trimmer dead and the rescue workers left the surge tunnel.

On the surface, a front-end loader and an excavator were used to remove the primary surge pile in order to gain access to the feeder from above. Once the material was moved away from the feeder, recovery workers re-entered the surge tunnel. Considerable time and care were taken to ensure the safety of the recovery team throughout the entire rescue and recovery operations.

Trimmer was recovered from the chute at 7:11 p.m. The cause of death was attributed to asphyxiation.

## **INVESTIGATION OF THE ACCIDENT**

The Mine Safety and Health Administration (MSHA) was notified of the accident at 11:45 a.m. by a phone call from Dino Faiola, east area manager, to Sabrina Railing, field office secretary. James R. Petrie, district manager, was then notified. An order was issued under the provisions of 103(k) of the Mine Act to ensure the safety of the miners. An investigation was started the same day. MSHA was not immediately notified of the entrapment and a non-contributory citation was issued.

MSHA's accident investigation team traveled to the mine, made a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted an investigation with the assistance of mine management, mine employees, and personnel from the Pennsylvania Department of Environmental Protection.

## **DISCUSSION**

### **Location of the Accident**

The accident occurred in the underground surge tunnel located beneath the primary surge pile. The victim had entered the chute for the No. 1 tunnel belt feeder to correct a "free flowing" condition by installing a restrictor plate.

### **Weather**

The weather on the day of the accident was partly cloudy with a temperature of 62 degrees Fahrenheit. Weather was not considered to be a factor in the accident.

### **Equipment**

The No. 1 belt received crushed product from the primary surge pile via a connecting hopper to a Syntron® Vibratory Feeder, Model F-55 BDT. The hopper's surface opening measured 33 ¼ inches wide by 56 ¾ inches long (see Figure 1). The hopper was lined with wear metal suspended from steel angles which framed the hopper opening. The hopper's side walls were nearly vertical. The rear wall was fabricated with a 13 ¾ inch long vertical section and an 18 ¾ inch long sloping section set on a 57 degree angle measured from the horizontal. The front wall was 54 inches from the top or surface down to the feeder trough with a gate opening at the bottom of 31 ⅛ inches wide by 36 inches high.

A piece of wear plate was in the right corner of the front wall. The plate was 2 ⅜ inches wide running the length of the corner set at 42 degree angle to the front wall and welded to the right side and front walls (see Figure 2).

The skirt for the chute extended into the tunnel 42 ¾ inches from the front wall in the direction of the No. 1 belt (see Figure 3). The feeder chute was 83 inches long from the hopper rear wall liner to the discharge end where it dumped onto the No. 1 belt. Two short pieces of steel angle were found welded to the sidewalls. They were nearly centered in the gate opening, 11 ⅛ inches from the top of the gate opening (see Figure 2). A piece of steel plate (16 inches wide by 31 inches long by ¼ inch thick) was found on the floor next to the tailpiece covered with stone.

Four steel rods located at the feeder's four corners kept it suspended (see Figure 4). The slope of the feeder chute was adjusted by changing the length (adding or removing shackles) of the front mounting points. The feeder chute was found sloping toward the No. 1 belt on a 14 degree angle as measured from the horizontal.

### **Primary Surge Pile**

The primary surge pile was used to store stone (minus 8-inch) which had passed through the primary crusher. As part of the investigation, the No. 1 belt feeder was emptied and the primary surge pile was pushed back from the feeder hopper inlet. The surge pile was not as large as it was originally because it had been partially removed during the attempted rescue/recovery.

Investigators determined that the existing pile was 10 to 15 feet above the right side and rear of the hopper walls. This configuration was high enough for the investigators to visualize what the cone resembled prior to the accident. A photo was taken to show the partial cone shaped pile after the feeder was emptied or "day lighted" (see Figure 5).

### **Training and Experience**

Larry R. Trimmer had 18 years, 33 weeks, and 2 days of mining experience. Gerald A. Evans had 20 years of mining experience. Joseph A. Newsome had 3 years and 26 weeks of mining experience. All three miners had received training in accordance with 30 CFR, Part 46.

## **ROOT CAUSE ANALYSIS**

A root cause analysis was performed and the following root causes were identified:

**Root Cause:** Management policies, procedures, and controls failed to ensure that persons could safely perform maintenance in the surge tunnel. The material in the primary surge pile above the No. 1 belt feeder was not removed and the discharge of materials had not ceased before persons started repairs in the feeder chute.

**Corrective Action:** Management policies, procedures, and controls should require that surge piles be removed before maintenance tasks begin.

**Root Cause:** A risk assessment was not performed to identify all possible hazards and ensure controls were in place to protect persons performing work in the surge tunnel. The victim entered a chute while material that could fall remained in the surge pile overhead.

**Corrective Action:** Management should ensure that a risk assessment is conducted before workers perform work. All persons conducting work should be trained regarding safe work procedures.

## CONCLUSION

The accident occurred because management policies, procedures, and controls did not ensure that persons could safely perform maintenance tasks in the surge tunnel. The victim entered the chute under the feeder hopper to perform maintenance but adequate measures had not been taken to assure that material from the primary surge pile did not fall into the chute.

## ENFORCEMENT ACTIONS

### **Pennsy Supply Inc.**

Order No. 6062182 was issued on October 7, 2008, under provisions of section 103(k) of the Mine Act.

On October 7, 2008, a fatal accident occurred when an employee was working in the feed hopper of the secondary crushing plant surge tunnel. The employee was engulfed by material. This order is issued to ensure the safety of any persons at the mine until an examination or investigation is made to determine that the secondary crushing plant and the surge tunnel are safe.

The order was terminated on October 10, 2008. Conditions that contributed to the accident have been corrected and normal mining operations can resume.

**Citation No. 6062657** was issued on October 28, 2008, under the provisions of Section 104a of the Mine Act for a violation of 30 CFR 56.16002(a)(1) / 56.16002(c):

A fatal accident occurred at this operation on October 7, 2008 when a maintenance lead man was engulfed by materials in a chute in an underground surge tunnel. He was working inside and below the hopper of the primary surge pile when material fell from the pile. The surge pile and hopper were not equipped with mechanical devices or other effective means of handling materials so that during normal operations persons are not required to enter or work where they are exposed to entrapment by the caving or sliding of materials. Furthermore, the victim entered the hopper and chute under the hopper to perform maintenance but management failed to ensure that the discharge of materials from the surge pile had ceased before starting the maintenance and repairs in the chute. This condition was a violation of 56.16002(a)(1) or 56.16002(c) or both.

This citation was terminated on November 3, 2008. The mine operator developed and implemented a written procedure for repair, maintenance, or modification of surge tunnel feeders and surge bin feeders specifically directing removal of surge material from bin and hopper walls and tunnel surge feed openings prior to commencing work. In addition, safety meetings were held with all persons that perform maintenance in the surge tunnel to review the new procedures.



Approved: \_\_\_\_\_

James R. Petrie  
District Manager

Date: \_\_\_\_\_

## **APPENDICES**

- A. Persons Participating in the Investigation
- B. Victim Data Sheet
- C. Photos from the Post-Accident Scene

## APPENDIX A

### Persons Participating in the Investigation

#### **Pennsy Supply Inc.**

Larry E. Stine	superintendent
Robert C. Dailey	vice president, occupational health and safety & environmental
Dino Faiola	east area manager
Scott M. Stahle	maintenance superintendent
Glenn L. Buffington	maintenance superintendent
Gerald A. Evans	secondary plant operator
Joseph A. Newsome	haul truck driver

#### **Keefer, Wood, Allen, & Rahal, LLP**

Stephen L. Grose	counsel
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#### **Pennsylvania Department of Environmental Protection**

Ryan Flynn	surface mine conservation inspector
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#### **Mine Safety and Health Administration**

Thomas J. Shilling	mine safety and health inspector
James R. Slick	mine safety and health inspector
Dale P. Ingold, P.E.	general engineer

## APPENDIX B

### Victim Data Sheet

Accident Investigation Data - Victim Information

**U.S. Department of Labor**  
Mine Safety and Health Administration

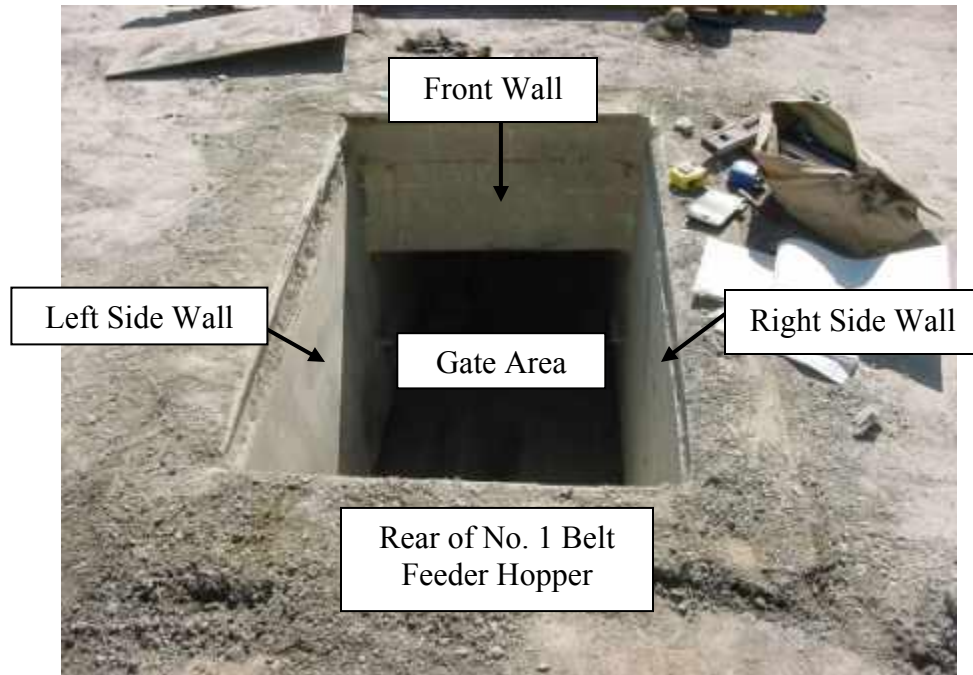


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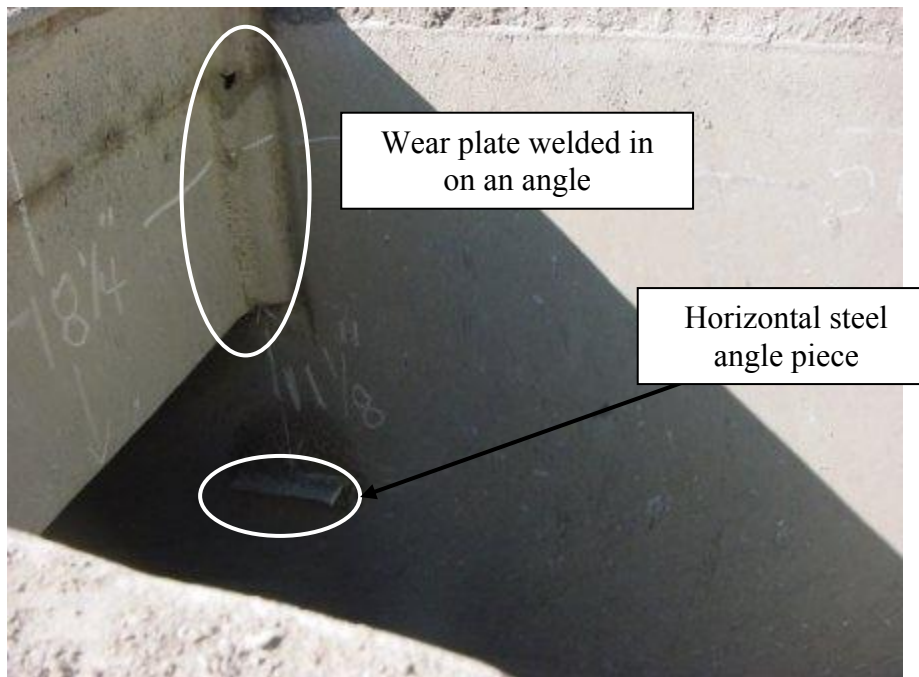
Victim Information: <input type="text" value="1"/>											
1. Name of Injured/Ill Employee: <i>Larry R. Trimmer</i>			2. Sex: <i>M</i>	3. Victim's Age: <i>56</i>		4. Degree of Injury: <i>01 Fatal</i>					
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 10/07/2008 b. Time: 11:35</i>						6. Date and Time Started: <i>a. Date: 10/07/2008 b. Time: 10:40</i>					
7. Regular Job Title: <i>004 Leadman</i>				8. Work Activity when Injured: <i>039 Attempting to install flow gate</i>				9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
10. Experience			b. Regular			c. This			d. Total		
	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
Work Activity:	<i>18</i>	<i>33</i>	<i>2</i>	Job Title:	<i>18</i>	<i>33</i>	<i>2</i>	Mine:	<i>18</i>	<i>33</i>	<i>2</i>
11. What Directly Inflicted Injury or Illness? <i>127 Sloughing of surge pile</i>						12. Nature of Injury or Illness: <i>110 Complications by Asphyxia</i>					
13. Training Deficiencies:											
Hazard:		New/Newly-Employed	Experienced Miner:		Annual:		Task:				
14. Company of Employment: (if different from production operator) <i>Operator</i>						Independent Contractor ID: (if applicable)					
15. On-site Emergency Medical Treatment:											
Not Applicable:		First-Aid:		CPR:		EMT:	<input checked="" type="checkbox"/>	Medical Professional:		None:	
16. Part 50 Document Control Number: (form 7000-1)						17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>					

## APPENDIX C

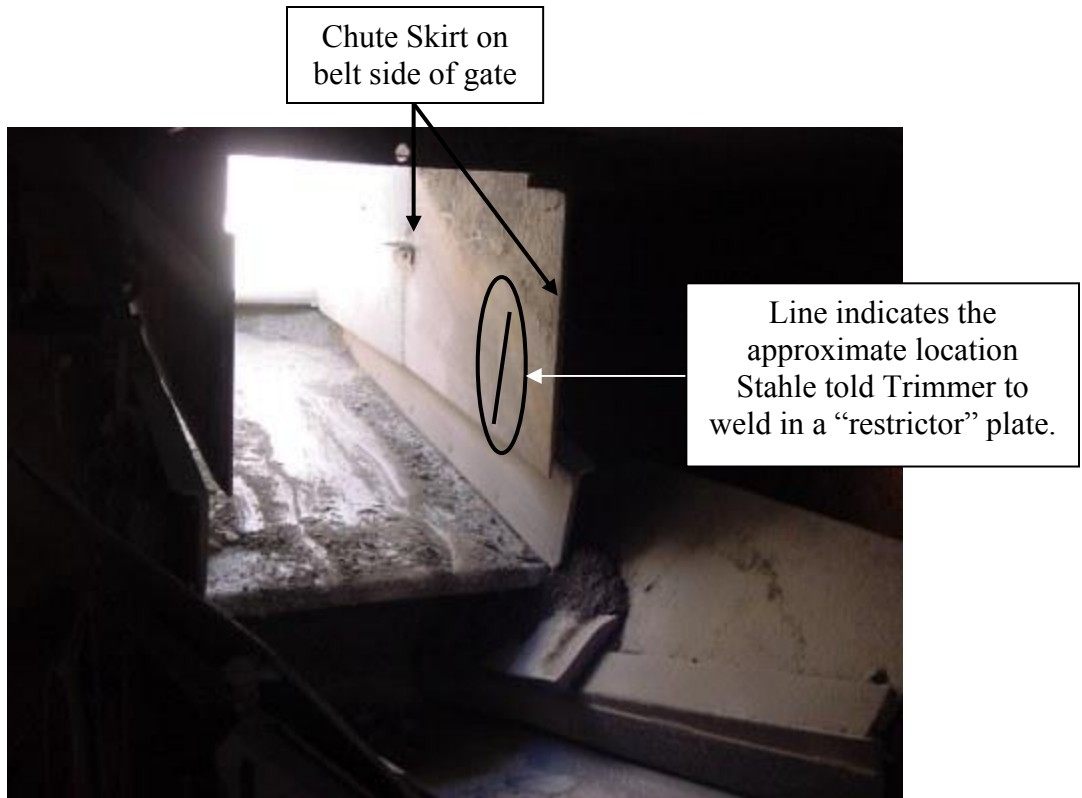
### Photos from the Post-Accident Scene



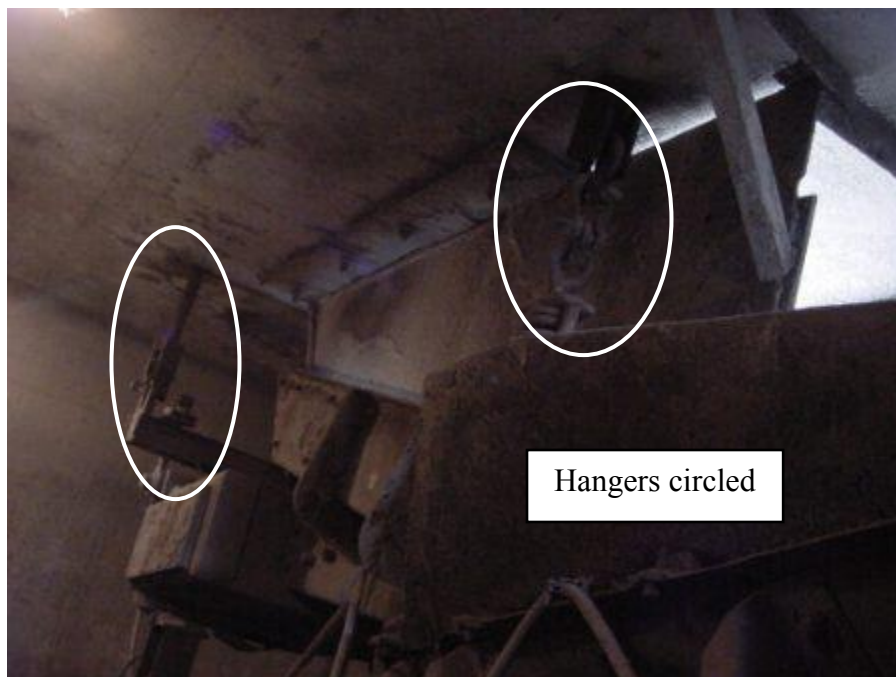
**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

Open "day lighted" No. 1  
Belt feeder hopper



**Figure 5**