FAI-6490311-1

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

# REPORT OF INVESTIGATION

Surface
(Aggregates)

Powered Haulage Accident
February 8, 2021

Washington County Aggregates Inc.
Potosi, Washington County, Missouri
ID No. 23-02077

Accident Investigators

Keith S. Markeson
Mine Safety and Health Inspector

Shawn Pratt
Supervisory Mine Safety and Health Inspector

Jeremy D. Kennedy
Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
Central Region - Madisonville District
100 YMCA Drive
Madisonville, KY 42431-9019
Robert A. Simms, District Manager

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## OVERVIEW

On February 8, 2021, at approximately 1:15 p.m., Gregory L. Solomon, a 38-year-old ground man with approximately eight months of mining experience, died when he became entangled in the self-cleaning tail pulley of a belt conveyor that was not guarded.

The accident occurred because the mine operator: 1) did not assure that the miner was working under the observation of an experienced miner until he completed his training, 2) did not assure guards were in place while machinery was operating, or 3) did not assure that power was off and equipment was blocked against hazardous motion before performing maintenance on machinery.

## GENERAL INFORMATION

Washington County Aggregates Inc. owns and operates the Washington County Aggregates Inc. mine. This mine is a surface limestone/dolomite mine located in Potosi, Washington County, Missouri. Washington County Aggregates Inc. employs 12 miners and operates one eight-hour shift, five days per week. The mine drills and blasts limestone and dolomite in an open pit and transports the rock by haul truck to an onsite processing facility where the rock is crushed and sized before it is stockpiled for sale.

Principal Officers for Washington County Aggregates Inc. at the time of the accident were:

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|---|---|
| Kelley C. Silvey | President |
| Nancy Portell | Corporate Secretary |

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine on June 30, 2020. The 2020 non-fatal days lost (NFDL) incident rate for Washington County Aggregates Inc. was zero, compared to the national average of 1.18 for mines of this type.

## DESCRIPTION OF THE ACCIDENT

On February 8, 2021, Solomon started his shift at 8:00 a.m. Solomon's regular duties as a ground man included walking around the plant looking for maintenance or repair issues and clearing out excess material from under conveyor belts. Solomon and Josh Poucher, Plant Operator, began the shift by conducting the workplace examination of the Upper Crushing & Screening Plant. After completing the workplace examination, Solomon started the crusher generator and Poucher went to the crusher operator's booth and started the belt conveyors.

Solomon and Poucher started crushing stone at approximately 10:00 a.m. At 11:30 a.m., Solomon and Poucher shut down the Upper Crushing & Screening Plant due to a maintenance issue with the primary crusher jaw belt conveyor. Solomon and Poucher went to the primary crusher to help with the belt conveyor repairs and then returned to the Upper Crushing & Screening Plant at 12:30 p.m. Solomon re-started the crusher generator and Poucher re-started the rest of the crushing plant from the crusher operator's booth. Poucher saw Solomon walking toward the plant warming shed after starting the generator.

At 1:00 p.m., Poucher began crushing stone at the secondary crusher. Based on information gathered during the investigation, investigators concluded that Solomon continued his regular duties. At 1:15 p.m. Poucher noticed the impactor feed (bypass) belt conveyor was not running. At 1:20 p.m., Poucher started to replace the bypass belt conveyor's drive belts and examined the belt conveyor to determine what caused the drive belts to break. Poucher then saw Solomon entangled in the bypass belt conveyor's tail pulley.

Poucher called Tammy Stark, Health and Safety Trainer, and told her to call 911. At 1:24 p.m., Stark called 911 and Emergency Services dispatched the police, the coroner, and an ambulance to the mine site. Stark also called Kelley C. Silvey, Washington County Aggregates, Inc. President, and informed him of the accident. At 1:31 p.m., the Washington County Sheriff's department arrived. The Washington County ambulance and Steve Hatfield, Coroner, arrived at 1:33 p.m. Hatfield pronounced Solomon dead at 1:35 p.m.

## INVESTIGATION OF THE ACCIDENT

On February 8, 2021, at 1:54 p.m., Silvey called the Department of Labor National Contact Center (DOLNCC). The DOLNCC contacted William L. Barnwell, Assistant District Manager. Barnwell contacted Shawn Pratt, Supervisory Mine Safety and Health Inspector, and Pratt dispatched Michael W. Perry, Mine Safety and Health Inspector, to the mine. At 5:20 p.m., Perry issued an order under the provisions of Section 103(k) of the Mine Act to assure the safety of the miners and preservation of evidence. Pratt then contacted Keith S. Markeson, Mine Safety and Health Inspector, and assigned him as the lead accident investigator. Pratt also contacted Jeremy D. Kennedy, Mine Safety and Health Inspector, to assist in the accident investigation.

Markeson, Kennedy, and Pratt, arrived at the mine site at 5:30 p.m. to conduct the investigation. MSHA's accident investigation team conducted a physical examination of the accident scene, interviewed miners, and reviewed conditions and work procedures relevant to the accident. See Appendix A for a list of persons who participated in the investigation.

## DISCUSSION

### Location of the Accident

The accident occurred at the tail pulley of the bypass belt conveyor, which is located under the discharge chutes for the Telsmith screen at the Upper Crushing & Screening Plant adjacent to the quarry pit (see Appendix B). Investigators were unable to determine who had removed a section of the area guard to access the bypass belt conveyor's tail pulley. The area guard enclosed three self-cleaning tail pulleys for three separate belt conveyors. The three separate belt conveyors are referred to as the stacker belt, the bypass belt conveyor and the Telsmith belt conveyor. Based on Solomon's normal duties and information gathered during the investigation, investigators concluded that Solomon entered this area to clean spilled material.

The area guard was constructed of multiple panels of expanded metal. The area guards were not securely attached to the belt conveyor structure. The mine operator had set the relatively small area guard panels on straight horizontal pins so that they could be easily removed or defeated. MSHA determined that the tail pulleys were improperly guarded. There were no warning signs to warn miners of the multiple hazards inside the guard or to instruct miners to turn the belt conveyors off and block against hazardous motion prior to entry.

### Equipment Involved

The bypass belt conveyor was equipped with an 8.5-inch diameter self-cleaning tail pulley (see Appendix C). The bypass belt conveyor can feed the horizontal shaft impactor at the plant or bypass the impactor and recirculate the rock back to the cone-crusher. Investigators found the belt conveyor in the bypass mode at the time of the accident. All three belt conveyors were not powered off or secured against hazardous motion before performing maintenance on the machinery.

### Weather

The weather at the time of the accident was 22 degrees Fahrenheit with overcast skies and a breeze of seven miles per hour. Investigators determined that weather was not a contributing factor for the accident.

### Other Contributing Factor

Based on examination of the accident scene, investigators concluded that Solomon's coat was unzipped because of a broken zipper which caused the front of the coat to flap open. Solomon's coat became entangled in the self-cleaning tail pulley of the bypass belt conveyor.

### Training and Experience

Gregory L. Solomon had approximately eight months of mining experience, all of them at the Washington County Aggregates Inc. mine. Solomon worked as a ground man for the entirety of

his employment. Norman J. Zeman, Educational Field and Small Mine Services, examined the mine's training plan, including Solomon's training records, and found he had received eight hours of new miner training on June 26, 2020. Zeman also determined that the new miner training was incomplete, not conducted in accordance with MSHA Part 46 training regulations, and Solomon was not working under the observation of an experienced miner.

Solomon's new miner training started on his first day of employment at the mine. Shortly after completing the initial eight hours of new miner training, Solomon left the mine for two weeks. When he returned, the mine operator neglected to complete his new miner training.

Investigators found that Solomon had not been working under the observation of an experienced miner at the time of the accident, as required by MSHA Part 46 training regulations. Investigators determined that the lack of observation by an experienced miner was a contributing factor in the accident.

Workplace Examinations

Based on interview statements and a review of records, investigators learned that Poucher and Solomon conducted the workplace examination of the Upper Crushing & Screening Plant at the start of the shift. A review of examination records showed that the person who entered the record on previous shifts noted cleaned spills, leaking chutes, and skirting repaired, as well as out-of-place guards. Poucher stated during interviews that the area guards were in place when he conducted his examination before beginning work on the day of the accident. Investigators determined that workplace examinations were not a contributing factor in the accident.

Work Practices

Based on interviews, investigators learned that miners had observed Solomon on multiple occasions cleaning under running belt conveyor pulleys. When miners saw this, they told Solomon to stop and warned him of the associated hazards. Several miners informed investigators that cleaning and maintenance regularly occurred while equipment was not locked and tagged out. While miners had been trained in proper lock-out/tag-out procedures, the mine operator did not provide locks or tags for miners to use.

## ROOT CAUSE ANALYSIS

The accident investigation team conducted an analysis to identify the underlying causes of the accident. The team identified the following root causes, and the mine operator implemented the corresponding corrective actions to prevent a recurrence.

1. Root Cause: The mine operator did not assure that the miner received the minimum required training to safely perform his job, or that the miner was observed by an experienced miner while working until he had completed such training.

   Corrective Action: The mine operator updated their training plan to include all tasks that are performed at the mine by position or role, and retrained all miners on this updated training plan. The mine operator will assure all new miners receive this revised new miner training.

2. Root Cause: The mine operator did not assure equipment was properly guarded.

   Corrective Action: The mine operator has installed appropriate equipment guards on all three of the belt conveyors enclosed by the area guard at the accident scene, and has completed a review of all other equipment guarding on the mine site.

3. Root Cause: The mine operator did not assure that power to equipment was off and equipment was blocked against hazardous motion before performing maintenance.

   Corrective Action: The mine operator developed a new written procedure for cleaning and performing maintenance on conveyor belts. The procedure requires the power to the conveyor belt to be turned off, locked and tagged out, and tested to assure power is off before guards are removed and cleaning or maintenance is performed. The mine operator retrained all miners in the procedure. The mine operator has provided locks and tags for the miners' use.

## CONCLUSION

On February 8, 2021, at approximately 1:15 p.m., Gregory L. Solomon, a 38-year-old ground man with approximately eight months of mining experience, died when he became entangled in the self-cleaning tail pulley of a belt conveyor that was not guarded.

The accident occurred because the mine operator: 1) did not assure that the miner was working under the observation of an experienced miner until he completed his training, 2) did not assure guards were in place while machinery was operating, or 3) did not assure that power was off and equipment was blocked against hazardous motion before performing maintenance on machinery.

Approved By:

_____ _____

Robert A. Simms Date
District Manager

## ENFORCEMENT ACTIONS

1. A 103(k) Order No. 9531221 was issued to Washington County Aggregates Inc. on February 8, 2021:

   A fatal accident occurred at this operation on February 8, 2021 when a miner made contact with the bypass conveyor. This order is issued to assure the safety of all persons at the operation. It prohibits all activity at the mine site until MSHA has determined that it is safe to resume normal mining operations. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and or restore operations.

2. A 104(a) citation was issued to Washington County Aggregates Inc. for a violation 56.14105.

   A fatal accident occurred at this operation on February 8, 2021, when a miner entered an area guard and became entangled in the machinery. The Impactor Feed belt conveyor and the Telsmith bottom belt conveyor at the Upper Crushing and Screening Plant were not powered off or secured against hazardous motion before maintenance of the machinery was started. This practice allowed the miner to become entangled in the self-cleaning tail pulley of the bypass belt conveyor resulting in his death.

3. A 104(a) citation was issued to Washington County Aggregates Inc. for a violation of 56.14107(a).

   A fatal accident occurred at this operation on February 8, 2021, when a miner entered an area guard and became entangled in the machinery. After entering the area, there was no guard on the self-cleaning tail pulley of the bypass belt conveyor at the Upper Crushing and Screening Plant to protect persons from contacting the tail pulley. The exposed moving parts were not at least seven feet away from walking or working surfaces. This condition allowed the miner to become entangled in the self-cleaning tail pulley of the conveyor.

4. A 104(d)(1) citation was issued to Washington County Aggregates Inc. for a violation of 46.5(a).

   A fatal accident occurred at this operation on February 8, 2021, when a miner entered an area guard and became entangled in the machinery. The miner had not completed the MSHA required 24-hours of new miner training and was not working where an experienced miner could observe that the new miner was performing his work in a safe manner. The miner had been working at the mine for over six months and was not in view of any other miner at the time of the accident.

   The mine operator engaged in aggravated conduct constituting more than ordinary negligence in that they did not provide the miner with the minimum MSHA required new miner training for him to safely perform his job and did not assure that he was working under the observation of an experienced miner until he was completely trained. This violation is an unwarrantable failure to comply with a mandatory standard.

APPENDIX A – Persons Participating in the Investigation

Washington County Aggregates Inc.

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| Kelley C. Silvey | President |
| Tammy Stark | Health and Safety Trainer |
| Austin Bailey | Yard Loader Operator |
| Josh Poucher | Plant Operator |
| Scott Tucker | Excavator Operator |
| Gerald Poucher | Pit Loader Operator |
| Joe Vick | Truck Driver/Ground Man |
| Mark Kay | Mechanic |

Washington County Sheriff's Department

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| Randall Martin | Corporal Sherriff |

Washington County Coroner's Office

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| Steve Hatfield | Coroner |

Mine Safety and Health Administration

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| Shawn Pratt | Supervisory Mine Safety and Health Inspector |
| Jeremy D. Kennedy | Mine Safety and Health Inspector |
| Keith S. Markeson | Mine Safety and Health Inspector |
| Norman J. Zeman | Educational Field and Small Mine Services |

APPENDIX B – Photograph of the Accident Scene

APPENDIX C – Photograph of the Equipment Involved