FAI-4458325-1

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

# REPORT OF INVESTIGATION

Underground
(Bituminous Coal)

Fatal Fall of Roof or Back Accident
March 20, 2022

D-29 Darby Fork
INMET Mining, LLC.
Holmes Mill, Harlan County, Kentucky
ID No. 15-02263

Accident Investigators

Saul Akers
Mine Safety and Health Specialist

Kevin Doan
Mine Safety and Health Specialist

Originating Office
Mine Safety and Health Administration
Barbourville District
3837 S U.S. Hwy 25 E
Barbourville, Kentucky 40906
Samuel Creasy, District Manager

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## OVERVIEW

On March 20, 2022, at approximately 11:00 p.m., James Brown, a 33 year-old roof bolter with 13 years of mining experience, died when he was struck by a roof fall while moving a waterline.

The accident occurred because the mine operator did not: 1) conduct a supplemental examination in the #8 entry of the 3 South Mains to identify and correct hazardous conditions prior to miners entering the #8 entry where work was to be performed, and 2) adequately support or otherwise control the roof where miners were required to work or travel in the #8 entry of the 3 South Mains.

## GENERAL INFORMATION

INMET Mining, LLC., a subsidiary of Industrial Minerals Group, LLC, owns and operates the D-29 Darby Fork mine. D-29 Darby Fork mine is an underground bituminous coal mine located near Holmes Mill, Harlan County, Kentucky. The mine employs 64 miners and operates three, eight-hour shifts per day, five days per week. The mine has been operating since 1993 and is mining in the Darby coal seam with one mechanized mining unit (MMU). The coal seam is under 300 feet of overburden, five feet high, and the mining height was six to seven feet at the

site of the accident. At the time of the accident, the mine operator was retreat mining in the 3 South Mains.

The principal management officials at the D-29 Darby Fork mine at the time of the accident were:

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| Gary Long | Superintendent |
| Gregory Seals | 3rd Shift Mine Foreman |

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine on February 28, 2022. The 2021 non-fatal days lost incident rate for the D-29 Darby Fork mine was 2.79, compared to the national average of 3.47 for mines of this type.

## DESCRIPTION OF THE ACCIDENT

On March 20, 2022, Brown began work on the maintenance shift at 10:00 p.m., and received his work assignment from Bernard Lewis, 3rd Shift Section Foreman. Brown and Paul Robbins, Scoop Operator, were assigned to move the high voltage power center and waterline to a location outby the active working section in the 3 South Mains. Brown attended a general safety meeting with the crew, then traveled underground at 10:12 p.m. Brown and Robbins traveled in a personnel carrier to the section. While enroute to the section, Brown and Robbins stopped at crosscut #37, where Robbins boarded a scoop. Brown arrived at crosscut #45 at approximately 10:30 p.m., stopped and picked up his tools, and then parked the personnel carrier in crosscut #46. Brown walked to the high voltage power center in crosscut #47 and waited for Robbins to arrive with the scoop.

When Robbins arrived, he and Brown traveled to the #8 entry of crosscut #47. Robbins scooped material out from the entry and placed it against the stopping (concrete block wall built in a crosscut to control ventilation) located between the #8 and #9 entries in crosscut #46, while Brown remained at crosscut #47. When Robbins returned, Brown informed Robbins that the water valve had been turned off in crosscut #47 and Brown also needed to turn off the next outby water valve. Robbins used the scoop bucket to start removing the stopping in crosscut #47 located between the #7 and # 8 entries. Robbins removed about half of the stopping while Brown observed from crosscut #47. In an interview, Robbins stated that Brown told him to lower the scoop bucket to prepare to strike the remaining blocks of the stopping. Brown then proceeded outby to turn off the next water valve. When directed by Brown, Robbins lowered the scoop bucket and struck the stopping with the scoop bucket. Immediately and without warning, the roof fell in the #8 entry at approximately 11:00 p.m. The roof fall measured approximately 20 feet wide, 52 feet long, and five feet high. The roof fall material extended to the back of the canopy over the scoop operator's compartment. Robbins, uninjured, exited the scoop operator's compartment and immediately began calling out for Brown.

Lewis was in the #8 entry, 20 feet inby the fall area when the accident occurred. Lewis joined Robbins calling out for Brown but did not receive a response. Lewis and Robbins searched the fall area on the inby side but could not see Brown. At 11:02 p.m., Lewis used the mine phone to

notify Gregory Seals, 3rd Shift Mine Foreman, who was on the mine surface, that a roof fall had occurred, and Brown could not be located. Lewis went to the outby side of the fall to search for Brown. Lewis called Seals back at 11:06 p.m. and said that Brown could not be located on the outby side of the fall. Lewis instructed crew members to begin setting timbers on both ends of the fall. Seals arrived at the fall location and assessed the area from all sides. Based on interviews, Lewis and Robbins believed Brown was underneath the outby portion of the fall. Crew members installed additional roof support prior to the start of rescue operations to assure the safety of all miners. Once roof support operations were completed, removal of the roof fall material was started.

The removal of roof fall material continued until the crew members recovered Brown on March 21, 2022, at 10:18 p.m. Brown was transported to the mine surface and pronounced dead by James Rich, Harlan County Deputy Coroner, at 10:48 p.m.

## INVESTIGATION OF THE ACCIDENT

On March 20, 2022, at 11:11 p.m., Seals called the Department of Labor National Contact Center (DOLNCC). The DOLNCC contacted Steve Sorke, Staff Assistant, who then contacted Samuel Creasy, District Manager. Creasy assigned Saul Akers, Mine Safety and Health Specialist, as the lead accident investigator and sent him; Dennis Cotton, Assistant District Manager; Argus Brock, Supervisory Mine Safety and Health Inspector; Kevin Doan, Mine Safety and Health Specialist; and Silas Brock, Mine Safety and Health Inspector, to the mine site. A. Brock and Doan arrived at the mine at 12:38 a.m. on March 21, 2022. Upon arrival, Doan 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. A. Brock and Doan then proceeded underground to monitor the ongoing rescue operations. Creasy arrived at 12:50 a.m. S. Brock arrived at approximately 1:00 a.m. and gathered witness statements. Akers arrived at approximately 8:00 a.m. Craig Plumley, Assistant District Manager; James Proffitt, Supervisory Mine Safety and Health Inspector; and Jack Foster, Mine Safety and Health Inspector, arrived at approximately 12:00 p.m. to relieve MSHA personnel at the accident scene. S. Brock returned at approximately 8:00 p.m. to relieve Proffitt. The removal of roof fall material continued until the crew members recovered Brown.

MSHA's accident investigation team, along with the Kentucky Division of Mine Safety, conducted an examination of the accident scene, interviewed miners and mine management, and reviewed conditions and work practices 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 in the intersection of #8 entry, crosscut #47, on the 3 South Mains, approximately 180 feet outby the retreat mining section, in an area that was not projected for retreat mining (see Appendix B and C).

Roof Control Plan and Support

The immediate roof (layer of roof immediately above the mined area) of the fall area was five feet thick and consisted of slickensided (compressed to form a slick surface) and laminated shale with coal and slickensided and laminated shale with a two-inch thick coal rider below a massive layer of sandstone. The roof fell up to the beginning of the sandstone where the coal rider created a weak plane. When the 3 South Mains were advance mined (initially mined leaving pillars to support the overburden) in 2017, the mine operator bolted the area with five-foot fully grouted resin bolts on four-foot centers and supplemented the support with ten-foot cable bolts, in accordance with the approved Roof Control Plan (see Appendix D). The five-foot resin bolts did not anchor into the sandstone and relied on the ten-foot cable bolts for anchorage. On March 17, 2022, before the accident, the mine operator began retreat mining and anticipated the need for supplemental roof support in the #1 through #7 entries in the 3 South Mains due to the additional stress on the roof caused by retreat mining in those entries. According to interviews and investigator observations, the mine operator directed miners to install additional ten-foot cable bolts in the #1 through #7 entries in the 3 South Mains.

The geologic conditions and hazards associated with the five-foot resin bolts not anchoring into the competent or sandstone roof were the same in the 3 South Mains and in the #8 entry where the roof fall occurred. The five-foot resin bolts were installed into slickensided laminated shale roof which was not capable of creating a competent beam. Torque tension resin bolts are more suitable to create a beam in laminated mine roof but were not installed. Additionally, the pattern and spacing of the installed cable bolts did not provide adequate roof support for the span of the intersection. The mine operator had extensive knowledge of the mine geology, roof conditions, and the importance of identifying the location of the sandstone in the mine roof, to provide proper roof bolt anchorage. Despite this knowledge, the mine operator did not install additional ten-foot cable bolts to support the #8 entry. A non-reportable roof fall occurred in the 3 South Mains on December 22, 2021. The primary roof support system installed, during advance mining in 2017 by the previous mine operator, was not suitable in the accident area to create a competent beam in slickensided laminated roof. The current mine operator, based on the mine operator extensive knowledge of the mine geology, did not add supplemental cable bolts in a pattern and spacing which would have properly supported the span of the intersection in the area of the accident. Investigators determined that this contributed to the accident.

Examinations

The preshift examination for the maintenance shift was conducted during the previous shift at 8:15 p.m. Preshift and on-shift examinations were not required where the roof fall occurred because work was assigned in that area after the preshift examination was completed. Once work was assigned in that area, a supplemental examination was required within three hours before miners entered the area. An adequate supplemental examination in this area should have included checking test holes, observing the roof, and striking and listening for the sound of loose material in the roof. Brown and Robbins were not certified to make the supplemental examination. During the investigation, investigators checked the test holes with a borescope and saw cracks, indicating separation of the immediate roof from the massive layer of sandstone. The cracks were also visible without the use of a borescope. During interviews, the mine's designated examiners stated that a supplemental examination was not conducted. The completion of such an examination would have allowed the mine operator to identify the cracks

and correct hazardous conditions prior to miners entering this area. Investigators determined that this contributed to the accident.

Training and Experience

Brown had 13 years of underground coal mining experience. Brown started working at the D-29 Darby Fork mine and received experienced miner training on September 30, 2020. Brown received annual refresher training on January 26, 2021, and January 31, 2022. Brown received all required training in accordance with MSHA Part 48 training regulations.

## 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 conduct a supplemental examination to identify and correct hazardous conditions prior to miners entering the #8 entry of the 3 South Mains where work was to be performed.

   Corrective Action: The mine operator provided additional training to all mine examiners on the requirements of §75.361, specifically regarding when and how to conduct supplemental examinations.

2. Root Cause: The mine operator did not adequately support or otherwise control the roof where miners were required to work or travel.

   Corrective Action: The mine operator installed additional roof support, which included 12-foot cable bolts, in the affected area. The mine operator moved the section to a new location and revised the Roof Control Plan. The mine operator trained all miners on the revisions made to the Roof Control Plan.

## CONCLUSION

On March 20, 2022, at approximately 11:00 p.m., James Brown, a 33 year-old roof bolter with 13 years of mining experience, died when he was crushed by a roof fall while moving a waterline.

The accident occurred because the mine operator did not: 1) conduct a supplemental examination in the #8 entry of the 3 South Mains to identify and correct hazardous conditions prior to miners entering the #8 entry where work was to be performed, and 2) adequately support or otherwise control the roof where miners were required to work or travel in the #8 entry of the 3 South Mains.

Approved By:

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Samuel Creasy Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) order was issued to INMET Mining, LLC.

   A fatal accident occurred on March 20, 2022, at approximately 11:30 p.m. This order is being issued under the authority of the Federal Mine Safety and Health Act of 1977, under Section 103(k) to insure the safety of all persons at the mine, and requires the operator to obtain the approval of an authorized representative of MSHA of any plan to recover any person in the mine or affected area. The operator is reminded of the obligation to preserve all evidence that would aid in investigating the cause or causes of the accident in accordance with 30 CFR 50.12.

2. A 104(d)(1) citation was issued to INMET Mining, LLC. for a violation of 30 CFR 75.361(a)(1).

   The mine operator did not conduct the required supplemental examination within three hours prior to miners entering the #8 entry at crosscut #47 of the 3 South Mains where two miners were scheduled to work. No supplemental examination was conducted for this area on the third shift. Two miners were working to move a high voltage power center and water line in the #8 entry of crosscut #47 when a roof fall occurred, resulting in the death of one of the miners.

   The mine operator engaged in aggravated conduct constituting more than ordinary negligence by not examining the area for hazardous conditions. The supplemental examination should include checking test holes, observing the roof, and listening and sounding the roof. During the investigation, investigators checked the test holes and saw cracks, indicating separation of the immediate roof from the massive layer of sandstone. Completion of the supplemental examination would have allowed the mine operator to identify the cracks and correct hazardous conditions prior to miners entering this area. This violation is an unwarrantable failure to comply with a mandatory standard.

3. A 104(d)(1) order was issued to INMET Mining, LLC. for a violation of 30 CFR 75.202(a).

   The mine operator did not adequately support or otherwise control the roof where miners were required to work or travel. Two miners were working to move a high voltage power center and water line in the #8 entry of crosscut #47 when a roof fall occurred, resulting in the death of one of the miners. The mine roof consisted of slickensided laminated shale and a coal-rider seam which were layered beneath massive layer of sandstone. The roof support system installed did not assure that roof bolts were anchored above the coal-rider horizon and into the massive layer of sandstone in the mine roof.

   The mine operator engaged in aggravated conduct constituting more than ordinary negligence by not installing adequate support prior to miners working and traveling in the affected area. The geologic conditions and hazards associated with not anchoring into the sandstone were the same in the 3 South Mains and in the #8 entry where the roof fall occurred. According to interviews and investigators' observations, the mine operator

demonstrated knowledge of the need for supplemental roof support in the 3 South Mains due to the additional stress on the roof caused by retreat mining when the operator directed the installation of additional roof support in the retreat mining area. The mine operator had extensive knowledge of the mine geology, roof conditions, and the importance of identifying the location of the sandstone in the mine roof, to provide proper roof bolt anchorage. However, the mine operator did not install additional support in the #8 entry where the roof fall occurred. This violation is an unwarrantable failure to comply with a mandatory standard.

APPENDIX A – Persons Participating in the Investigation

INMET Mining, LLC

| | |
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| Gary Long | Superintendent |
| Gregory Seals | 3rd Shift Mine Foreman |
| Bernard Lewis | 3rd Shift Section Foreman |
| Michael Massengale | Section Foreman |
| Steven Overby | Outby Foreman |
| Craig Travis | Engineer |
| Sean Pace | 3rd Shift Preshift Examiner |
| Derek Hall | Electrician |
| Owen Sharrett | Electrician |
| Eric Huff | Scoop Operator |
| Paul Robbins | Scoop Operator |

Kentucky Division of Mine Safety

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|---|---|
| Jeffrey Brock | Chief Accident Investigator |
| Billy Allen | Mine Safety Specialist |
| Matthew Alred | Mine Safety Specialist |
| Roger Boggs | Mine Safety Specialist |
| Dustin Clem | Mine Safety Specialist |

Mine Safety and Health Administration

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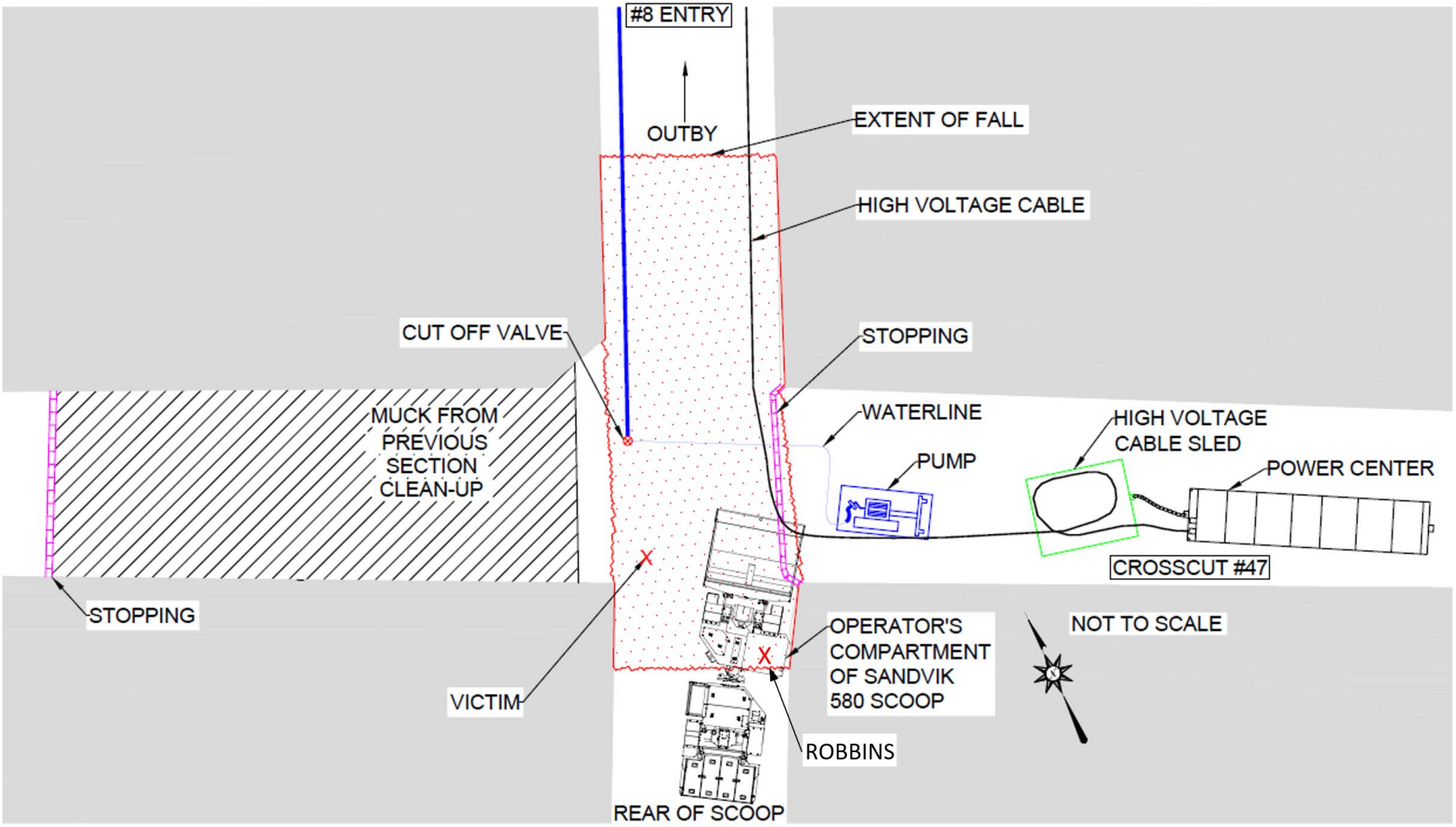
|---|---|
| Samuel Creasy | District Manager |
| Craig Plumley | Assistant District Manager |
| Dennis Cotton | Assistant District Manager |
| Argus Brock | Supervisory Mine Safety and Health Inspector |
| James Proffitt | Supervisory Mine Safety and Health Inspector |
| Kevin Doan | Mine Safety and Health Specialist |
| Saul Akers | Mine Safety and Health Specialist |
| Silas Brock | Mine Safety and Health Inspector |
| Jack Foster | Mine Safety and Health Inspector |

APPENDIX B – 3 South Mains Section Map

APPENDIX C – Sketch of Accident Scene



APPENDIX D – Profile View Sketch of the Roof Strata in the Fall Area