CAI-2018-03

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Powered Haulage Accident
March 16, 2018

Oaktown Fuels Mine No. 1
Sunrise Coal LLC
Oaktown, Knox County, Indiana
I.D. 12-02394

Accident Investigators

Keith Duncan
Coal Mine Safety and Health Inspector

Bobby Smith
Coal Mine Safety and Health Inspector

Ronald Medina
Mechanical Engineer
MSHA Technical Support

Originating Office
Mine Safety and Health Administration
District 8
2300 Willow Street
Vincennes, Indiana
Ronald W. Burns, District Manager

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OVERVIEW

On Friday March 16, 2018, at approximately 11:50 a.m., Jason M. Williams, a 34 year-old outby mechanic with 16 years of mining experience was fatally injured while operating a personnel carrier on a mine haulage road. The vehicle struck the right coal rib and rolled onto its left side. Williams was partially ejected from the personnel carrier and became trapped between the canopy of the personnel carrier and the mine floor.

This accident occurred because the mine operator did not assure that equipment operators maintain full control of the personnel carrier while it was in motion. In addition, mine management did not provide safety features to prevent persons in outby personnel carriers from being ejected.

GENERAL INFORMATION

The Oaktown Fuels Mine No. 1 is located near Oaktown, Knox County, Indiana, and is operated by Sunrise Coal, LLC. Coal is mined from the Indiana No. 5 coal seam, which averages 7 feet in height and has a depth-of-cover of approximately 430 feet. At the

time of the accident, the mine employed 333 personnel. The mine operates 6 days per week, with 2 production shifts and 1 idle shift each day and produces approximately 24,000 tons of raw material per day.

A conveyor belt transports coal to the surface through a slope. The slope is also used to transport supplies using tractors and trailers. Additionally, the mine has an elevator to transport miners and materials in and out of the mine. At the time of the accident, the mine was ventilated with an exhaust fan. Air enters the mine via the slope, elevator shaft, and intake air shaft. The mine has 6 active mechanized mining units (MMUs) and 2 inactive MMUs. All mining sections utilize a split air ventilation system.

The mine liberates 2,340,738 cubic feet of methane in a 24-hour period and is on a 5-day spot inspection schedule in accordance with Section 103(i) of the Mine Act.

The principal officers at the time of the accident were:

Rick Pigg..... Operations Manager
L. Kenny Chaney.....Superintendent
Terry M. Dowell ..... Safety Manager
Scotty Kent .....Shift Mine Manager

The Mine Safety and Health Administration (MSHA) began a regular (EO1) safety and health inspection on January 2, 2017. This inspection had not been completed at the time of the accident. The previous regular safety and health inspection was completed on December 31, 2017. The non-fatal days lost (NFDL) injury incidence rate for the Oaktown Fuels Mine No. 1 in 2017 was 2.06, compared to the National NFDL rate of 3.48 for mines of this type.

DESCRIPTION OF ACCIDENT

On Friday, March 16, 2018, at about 6:00 a.m., Williams reported for work on the day shift at the south portal of the mine. He attended a short meeting with Greg Hunt, Shift Maintenance Foreman, who assigned him to assist Unit No. 4 mechanics with coal hauler battery repairs. The outby mechanics normally work in pairs to conduct maintenance and repair work on the unit and outby equipment throughout the mine. This day, however, they were split up so they could cover a larger area of the mine. Mine tracking system records indicate that Williams entered the mine via the elevator at 6:35 a.m. He then drove a 2-person Alpha diesel personnel carrier, company number KWT 36, along the travelway/secondary escapeway toward Unit No. 4.

Williams arrived on Unit No. 4 at 7:08 a.m. and helped mechanics Joshua Roberts, Doug Lauderdale and Ryan Nickless repair damaged batteries. After completing the work on the batteries at about 11:38 a.m., Williams asked the group if they needed help with anything else. When they replied "No," at 11:39 a.m., Williams left Unit No. 4, and drove the diesel personnel carrier along the same travelway after leaving Unit No. 4. He did not tell the miners where he was going. The mine tracking system showed Williams traveled approximately 20,000 feet in the personnel carrier along the travelway, and at about 11:50 a.m. struck the right coal rib between crosscuts 135 and 136 of the M5 travelway. The diesel personnel carrier rolled onto its left side and Williams was partially ejected. He was trapped between the personnel carrier's canopy and the mine floor. There were no witnesses to the accident.

A carbon monoxide (CO) sensor located between crosscuts 137 and 138 on the M5 conveyor belt measured 5 ppm of CO and went into alert status at 12:00 p.m. Miranda Lewlyn, Mine Dispatcher, looked on the tracking system and noted that Williams was located near this sensor. She sent him a text message asking if there was diesel equipment parked in the area to see if that was the source of the CO. The tracking system computer showed that he did not read this message. Investigators determined that Williams read text messages sent before the accident, indicating that the accident occurred before Lewlyn sent this message.

Clayton Wise, Mine Examiner, was driving a personnel carrier while conducting a preshift examination of the travelways for the oncoming shift. At crosscut 30 of the M6 travelway, he encountered light smoke and smelled diesel exhaust. Wise attempted to find the source of smoke, and, as he traveled, the smoke cleared. He could see lights in the travelway ahead of him, but could not identify them. Wise arrived at the accident scene at 12:27 p.m. and found the personnel carrier lying on its side. He immediately ran to the vehicle to see if someone was injured. Wise found Williams trapped under the personnel carrier with the canopy on his chest.

Wise checked for vital signs but could not find a pulse. He then attempted to lift the personnel carrier off of Williams by hand but was unable to do so. At about 12:29 p.m., Wise notified dispatch of the accident and requested assistance. Lewlyn texted Scotty Kent, Shift Mine Manager, and L. Kenny Chaney, "Call Dispatch ASAP." They contacted Lewlyn and she provided information about the accident. They proceeded to the accident scene in Kent's personnel carrier. While on their way, they encountered Hunt and asked him to go to Unit No. 1, and bring the Unit No. 1 ambulance to the accident scene. Lewlyn contacted James Todd, Unit No. 2 Mechanic, at 12:46 p.m., to

tell him to take the Unit No. 2 ambulance to the accident scene. She also contacted Dowell and relayed information about the accident to him. At 12:47 p.m., Dowell called 911 to request the assistance of emergency personnel.

Kent and Chaney arrived at the scene at 12:51 p.m. They determined that a forklift would be needed to lift the personnel carrier off Williams. They traveled to crosscut 1 on the M6 travelway to get a diesel forklift. Chaney dropped Kent off at this location and returned to the accident scene.

Hunt and Todd arrived at the accident scene at approximately 12:56 p.m. with the ambulances. Chaney and Wise gathered wood blocks to support the personnel carrier once it was lifted off Williams. At 1:00 p.m., Kent returned to the accident scene with the forklift, which lifted the personnel carrier. Due to the extent of Willams' injuries, CPR was not started. Williams was placed in a basket/backboard and then into the Unit No. 2 ambulance. Todd and Kent transported him to the elevator. Chaney and Kent accompanied Williams to the surface, arriving at 1:23 p.m. The Knox County EMS ambulance was waiting on the surface. Williams was placed in the ambulance and held at the mine until Brian Hagen, Knox County Coroner, arrived, pronouncing him dead at 2:30 p.m.

INVESTIGATION OF THE ACCIDENT

Dowell called the Department of Labor (DOL) National Contact Center at 12:46 p.m. on March 16, 2018, to report the accident. At 12:56 p.m., the DOL Contact Center notified Mary Jo Bishop, Assistant District Manager – Enforcement, that the accident occurred. Bishop immediately contacted Oaktown Fuels Mine No. 1 management to inform them of their obligation to preserve any evidence pertaining to the accident. Bishop contacted George Heacock, Supervisory Coal Mine Safety and Health Inspector, to inform him of the accident. Heacock assigned Keith Duncan and Bobby Smith, Coal Mine Safety and Health Inspectors, to investigate the accident. Smith arrived at the mine and issued a 103(k) order at 1:40 p.m.

Duncan, Heacock, and Bishop arrived and began taking written statements and holding informal interviews. At approximately 5:45 p.m., the MSHA investigation team, along with Indiana Bureau of Mines' inspectors, and representatives from Sunrise Coal, traveled underground to the accident site for the initial on-scene investigation. See Appendix A for a list of persons participating in the investigation.

An autopsy was performed on March 17, 2018, at Good Samaritan Hospital. The cause of death was attributed to closed chest and abdominal injuries, as a result of the victim being trapped under the personnel carrier. Also, the autopsy revealed no preexisting medical conditions or substances that could have contributed to the accident or cause of death.

On March 19, 2018, Denzil Hughes, MSHA Supervisory Training Specialist, reviewed training records and found that Williams' training was up-to-date.

Formal interviews were conducted on March 21, 2018, at the MSHA District 8 Office in Vincennes, Indiana. See Appendix A for a list of persons interviewed.

On March 26, 2018, Ron Medina, Mechanical Engineer, and Gary Rethage, Mechanical Engineer, both with MSHA Technical Support, collaborated with investigators to examine the personnel carrier involved in the accident.

DISCUSSION

Accident Scene

The accident occurred on the M5 travelway at crosscuts 135 and 136 in entry No. 4. This is a main travelway and secondary escapeway for the mine. The entry was approximately 7 feet high and 18 feet wide. The mine floor was compacted with no abnormalities or deformities. When investigators arrived at the accident scene, they found the personnel carrier on its left side. It had been raised above the mine floor with two sets of 6" x 6" wood crib blocks under the canopy. Tire tracks showed the path the personnel carrier took to the point of impact. See Appendix B for a drawing of the accident scene.

Investigators observed hydraulic oil and diesel fuel on the mine floor that spilled from the tanks in the rear of the personnel carrier. The right coal rib that the personnel carrier struck had sheets of wire mesh bolted to the coal rib and was well rock dusted, except for the point of impact twenty-one inches above the mine floor. The impact left a hole in the wire mesh that was 2 feet wide and 1½ feet long. The right front bumper of the personnel carrier had been pushed into the right front tire which prevented investigators from being able to move the tire.

The personnel carrier's front tire tread was compared to the tire track leading to the point of impact and found to be a match. The steering wheel and the windshield of the

personnel carrier had no visible damage. No physical evidence found at the accident scene established why the diesel personnel carrier struck the coal rib.

Company No. KWT 36 diesel-powered personnel carrier

The personnel carrier, serial number 3561, is a rear-wheel drive. It was manufactured by Alpha Services and is an Alpha Model A3-9-63-BZ. It is powered by a 63 horsepower (@ 2500 rpm) Mitsubishi engine. The MSHA approval No. is 07-ENA030001. It is equipped with a GM 350 automatic transmission and the rear axle was connected to the transmission with a drive shaft. The personnel carrier was equipped with 215/75R15 tires on both the front and rear axles.

Examination & Evaluation of the diesel-powered personnel carrier

The GM 350 transmission was manufactured by General Motors with 3-speeds and was installed in passenger vehicles. The transmission gear ratios are 2.52:1 in first, 1.52:1 in second, and 1.00:1 in third. The company that purchased this personnel carrier from Alpha Services requested an e-clip to be installed that prevented the transmission from going into 3rd gear. This e-clip limited the top speed of this personnel carrier to about 19.4 mph.

The transmission installed on the personnel carrier was removed and examined. Unlike the Alpha design, it did not have the e-clip to prevent shifting into third gear. This allowed the vehicle to be shifted into third gear and travel approximately 10 mph faster (29.5 mph) than the original Alpha Services design. Since the personnel carrier was purchased by the previous mine operator, investigators could not determine who changed the transmission. Investigators were not able to determine the speed of the personnel carrier at the time of the accident.

Although automotive-type power train components were used in the construction of this vehicle, the vehicle width is narrower than ordinarily found in passenger vehicle applications. Also, mine-duty suspension is utilized as opposed to a passenger vehicle suspension. The safety checklist provided by Alpha Services with each vehicle covers numerous operating and safety features including the following statement:

> HANDLING CHARACTERISTICS: As with all underground equipment, this vehicle does not handle like an ordinary vehicle. Failure to operate this vehicle correctly could cause loss of control of the vehicle, which could result in a serious accident.

The mine-duty suspension and the narrower wheel track increased the potential for tilting or overturning the vehicle. However, investigators determined that the manner in which the vehicle struck the rib was the primary factor as to why the vehicle overturned.

The brake system was also inspected. The personnel carrier was equipped with a foot pedal controlled, dual circuit service brake system with disc brakes at all four wheels. There was no power assist.

The personnel carrier was also equipped with a spring-applied, hydraulic-release driveline parking brake, with release pressure provided by an engine driven hydraulic pump. A hand-operated pump was also provided to allow release of the parking brake for towing. After the vehicle hit the rib and came to rest on its left side, fluid leaked out from the hydraulic tank for the parking brake. To allow the service brakes to be tested, hydraulic fluid was added so the parking brake could be released.

The vehicle could not be operated under its own power because the engine was damaged in the accident. A motor mount was broken and the engine moved forward causing radiator and cooling fan damage. The front and rear axles were intact and the vehicle could be propelled with assistance. The front right tire was freed by cutting a section of the bumper and lower fender to allow the tire to turn freely so that braking tests could be performed.

The service brake system was not damaged in the accident. Both chambers of the dual service brake master cylinder reservoir, as found, were ½ to ¾ full which was adequate to allow service brake operation. No brake fluid was added to the master cylinder.

The service brakes were tested in a surface shop area. Dynamic stopping tests from a speed of approximately 5 mph showed that the service brakes were adequate and could achieve a 0.25 g stop as measured with a Tapley Brake Test Meter. This is equivalent to the braking capability needed to hold the personnel carrier on a 26% grade. The tires slid during the stopping test so the measured braking force was limited by the available coefficient of friction of the crushed limestone test surface. The vehicle was carrying no materials at the time of the accident and was tested empty.

All four tires were removed and the service brake hardware was inspected. The brake rotors were all thicker than the minimum disc thickness of 23 mm (0.906 inches) specified by the manufacturer. The steering axle brake linings were 0.29 inches thick on the left side and 0.31 inches thick on the right side. The drive axle brake linings were 0.25 inches thick on the left side and 0.22 inches on the right. These lining thicknesses

were within the manufacturer's specifications. All the brake linings and rotors were dry and clean and not contaminated with oil or grease.

In addition to the service brake testing, the parking brake, when applied, demonstrated the ability to slide the rear tires on a dry, smooth concrete shop floor. Additionally, the throttle linkage operated freely and returned to low idle upon release.

The personnel carrier was equipped with coil-spring/shock absorber suspension on both axles. It was also equipped with an automotive-type power steering system. All the steering linkage was intact. The steering wheel could be turned fully in each direction when the engine was off.

The vehicle had two forward facing headlights and one forward facing rib light angled to the right to illuminate the right rib. It was also equipped with a reverse light and a tail light. All the lighting systems functioned when tested. The inside of the operator's cab and windshield were not damaged.

The personnel carrier did not have seat belts at the time of the accident. Alpha Services did not manufacture this personnel carrier model with seat belts. Seat belts were provided as an option if requested by the customer.

To meet the requirements of the initial purchaser, Alpha Services originally equipped the personnel carrier with clevises. A previous operator installed a safety chain, between the clevises, across the opening of the operator's compartment. Investigators found that the clevises and safety chain had been removed from the personnel carrier, however, they were unable to determine who removed them.

Summary

The service brake system, the steering system, the throttle linkage, and the lights were evaluated and no defects were found.

Training and Experience

Denzil Hughes, MSHA Supervisory Training Specialist, reviewed training records. Hughes determined that the training received by Williams, who had 16 years and 8 months total mining experience, was in compliance with 30 CFR Part 48.

ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the most basic causes of the accident that were correctable through reasonable management controls. Root causes were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are the root causes identified during the investigation and the operator's implemented corrective actions to prevent a recurrence of this type of accident:

1. Root Cause: The mine operator did not assure that equipment operators maintain full control of the equipment while it was in motion.

   Corrective Action: The mine operator retrained all miners on its existing safe operating program for diesel powered equipment. For personnel carriers equipped with three or four gears, the mine operator removed the ability for those transmissions to shift into third or fourth gear, in order to reduce the maximum traveling speed of the carriers. For personnel carriers equipped with only two gears, the mine operator utilized a mechanism to reduce maximum speed

2. Root Cause: The mine operator did not provide safety features to prevent persons in outby personnel carriers from being ejected.

   Corrective Actions: The mine operator installed doors on personnel carriers. On personnel carriers where doors were unable to be installed, the mine operator installed netting and/or seatbelts.

CONCLUSION

On Friday March 16, 2018, at approximately 11:50 a.m., Jason M. Williams, a 34 year-old outby mechanic with 16 years of mining experience was fatally injured while operating a personnel carrier on a mine haulage road. The vehicle struck the right coal rib and rolled onto its left side. Williams was partially ejected from the personnel carrier and became trapped between the canopy of the personnel carrier and the mine floor.

This accident occurred because the mine operator did not assure that equipment operators maintain full control of the personnel carrier while it was in motion. In addition, mine management did not provide safety features to prevent persons in outby personnel carriers from being ejected.

Approved By:

_____ _____

Ronald W. Burns Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) Order, No. 9105602 was issued to Sunrise Coal LLC to protect the safety of all persons on site. It affected all areas of the M5 travelway from crosscut #131 - #138 and the KWT 36 2 man Alpha diesel personnel carrier.

2. A 104(a) Citation was issued for a violation of 30 CFR § 75.1916(b) to Sunrise Coal LLC.

   On March 16, 2018, at approximately 11:50 a.m., a miner was fatally injured while operating the KWT 36 2-person Alpha diesel personnel carrier. The personnel carrier was traveling along the M5 travelway and at crosscuts 135 and 136 it struck the right coal rib causing it to roll onto its left side, partially ejecting the operator resulting in fatal injuries. The equipment operator failed to maintain full control of the personnel carrier while it was in motion. Mine management did not provide safety features to prevent persons in outby personnel carriers from being ejected.

3. A 314(b) Safeguard was issued pursuant to 30 CFR § 75.1403 to Sunrise Coal LLC.

   On March 16, 2018, at approximately 11:50 a.m., a miner was fatally injured while operating the KWT 36 2-person Alpha diesel personnel carrier. The personnel carrier was traveling along the M5 travelway and at crosscuts 135 and 136 it struck the right coal rib causing it to roll onto its left side, partially ejecting the operator resulting in fatal injuries. By not having a system in place to keep all operators and persons being transported in rubber tired outby diesel-powered personnel carriers within the confines of the structural support of the vehicle, occupants may be injured or killed from impacts with coal ribs, other equipment or structures, or by being ejected from the vehicle. This is a notice to provide safeguards to require the mine operator to implement, maintain, and use a system to prevent persons in outby personnel carriers from being ejected.

APPENDIX A

Persons Participating in the Investigation

(Persons interviewed are indicated by a * next to their name)

The Sunrise Coal LLC, Oaktown Fuels Mine No. 1 Personnel

*L. Kenny Chaney	Superintendent
Terry M. Dowell	Safety Manager
*Caleb Owings	Diesel Shop Mechanic
*Brandon Patton	Outby Laborer
*Joshua Roberts	Unit No. 4 Mechanic
*Clayton Wise	Mine Examiner
*James Todd	Unit No. 2 Mechanic
*Greg Hunt	Shift Maintenance Foreman
*Scotty Kent	Shift Mine Manager

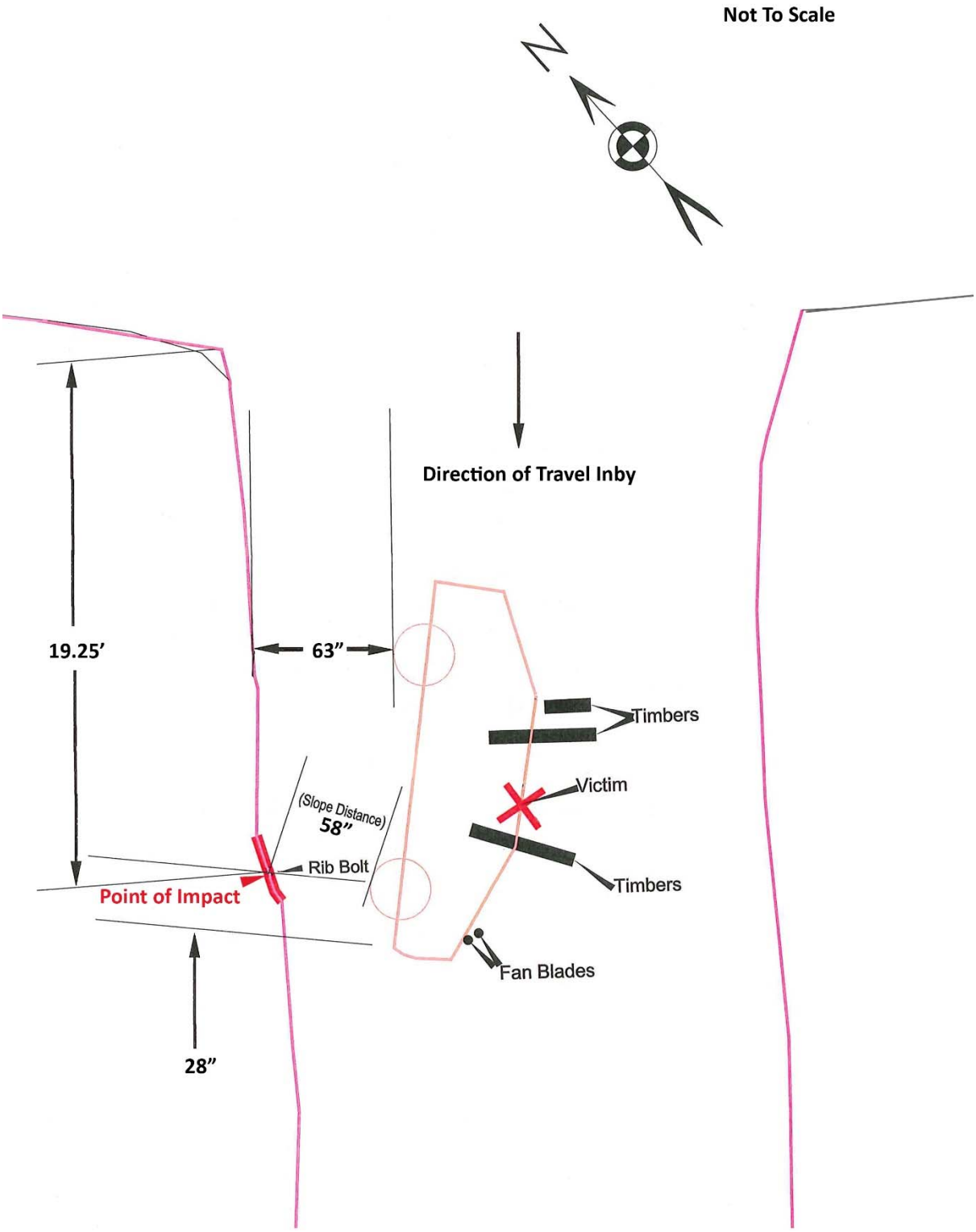
State of Indiana Bureau of Mines

Steve Riley	Assistant Commissioner
Joby Johnson	Chief Mine Inspector

Mine Safety and Health Administration

Mary Jo Bishop	Assistant District Manager (Enforcement)
George Heacock	Supervisory CMS&H Inspector
Keith Duncan	CMS&H Inspector (Accident Investigator)
Bobby Smith	CMS&H Inspector
Ron Medina	Mechanical Engineer, MSHA Technical Support
Gary Rethage	Mechanical Engineer, MSHA Technical Support
Denzil Hughes	MSHA Supervisory Training Specialist

APPENDIX B
Accident Scene Drawing



APPENDIX C
Victim Information

Accident Investigation Data - Victim Information
Event Number: 7 0 0 0 5 2 3

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

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
Jason M. Williams	M	34	01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 03/16/2018 b. Time: 11:50	a. Date: 03/16/2018 b. Time: 6:30

6. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
004 mechanic	073 Personnel Carrier	Yes X No

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	16	32	0	b. Regular Job Title:	16	32	0	c. This Mine:	2	32	0	d. Total Mining:	16	32	0

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
077 Personnel Carrier roll over	170 Crush by mantrip during roll over

13. Training Deficiencies:
Hazard: | New/Newly-Employed Experienced Miner: | Annual: | Task:

14. Company of Employment: (If different from production operator)
Operator
Independent Contractor ID: (if applicable)

15. On-site Emergency Medical Treatment:
Not Applicable: | First-Aid: | CPR: | EMT: | Medical Professional: | None: X

16.Part 50 Document Control Number: (form 7000-1) 220180850034
17. Union Affiliation of Victim: 9999 None (No Union Affiliation)