FAI-7035048-1

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface
(Dimensional Sandstone)

Fatal Machinery Accident
April 9, 2023

South Pittsburg Stone #2
South Pittsburg Stone
Orme, Marion County, Tennessee
I.D. No. 40-03591

Accident Investigator

Phillip Carter
Mine Safety and Health Inspector

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

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OVERVIEW

On April 9, 2023, Filemon Ortiz, a 63 year-old laborer with approximately ten years of mining experience, died while mounting off-road truck tires on two-piece wheel rims with lock rings (rims). The lock ring from one of the assembled rims dislodged, causing the lock ring to propel into the air and strike Ortiz.

The accident occurred because the mine operator did not: 1) correct defects on rims that affected safety to prevent the creation of a hazard to miners, 2) provide task training for mounting tires on rims, and 3) notify MSHA when mining commenced.

GENERAL INFORMATION

South Pittsburg Stone owns and operates South Pittsburg Stone #2, a surface dimensional sandstone mine in Orme, Marion County, Tennessee. The mine employs seven miners and operates one ten-hour shift, five to six days per week. Excavators extract the stone and haul trucks transport it to the sorting area. Miners hand sort the stone by size and place them on pallets. Contract trucking companies transport stone from the mine to off-site distribution facilities.

The principal management officials at South Pittsburg Stone #2 at the time of the accident were:

Julio Sales-Domingo	Owner
Virgilio Sales-Vasquez	Foreman

The mine operator had been operating illegally on this property for approximately one year and did not notify the Mine Safety and Health Administration (MSHA) before commencement of mining. Therefore, MSHA had not conducted a regular safety and health inspection, and since the mine operator was not reporting injuries and work hours, no non-fatal days lost injury rate could be calculated. The mine operator legally operated a mine at a different location that was abandoned October 1, 2021, and was aware of MSHA's requirements.

DESCRIPTION OF THE ACCIDENT

On April 9, 2023, at 6:00 a.m., Ortiz; Sales-Vasquez; Juan Perez, Truck Driver; Enrique Simerez, Excavator Operator; and Walter Lopez, Ilario Vasquez, and Marvin Lopez, Stackers, arrived at the mine. Sales-Vasquez assigned Ortiz to assist in mounting eight regrooved truck tires on rims (wheel assembly). W. Lopez, Vasquez, and M. Lopez began hand sorting stockpiled stones and placing them on pallets in the mine yard. Perez operated a haul truck and Simerez operated the excavator to load the stones out of the open pit area, located approximately one mile downhill from the mine yard.

According to interviews, Ortiz and Sales-Vasquez mounted the truck tire onto a rim by placing the interior protective liner over the rim and installing the inner tube inside the tire. Ortiz and Sales-Vasquez fastened the lock ring inside the rim and filled each tire to 70 pounds per square inch (psi) with no method to restrain the wheel assembly components in the event of failure. The rated capacity listed on the tires is 120 psi, but the trucks operate at a lower tire pressure to prevent blowouts due to hauling on rough and rocky terrain.

At approximately 7:00 a.m., Ortiz and Sales-Vasquez completed the first wheel assembly and placed it on a pallet lying flat with the lock ring side pointed up. By 10:00 a.m., Ortiz and Sales-Vasquez began working on the fourth wheel assembly, about 20 feet away from the first wheel assembly, when the first wheel assembly's lock ring dislodged, propelling the lock ring into the air. The lock ring flew into the air high enough for Ortiz and Sales-Vasquez to turn in the direction of the loud "pop" sound. The lock ring came down and struck Ortiz. Sales-Vasquez was within two feet of Ortiz when the accident occurred and stated that Ortiz died instantly. See Appendix A for a drawing of the accident scene.

W. Lopez, Vasquez, and M. Lopez were working approximately 100 feet away, heard the lock ring dislodgement and came to the accident area. Sales-Vasquez instructed them to stay back from the accident scene. At 10:10 a.m., Sales-Vasquez called Clint Carroll, Realtor, who brokered the contract between Sales-Domingo and Steve Brown, Landowner. Carroll instructed Sales-Vasquez to call 911 immediately. Sales-Vasquez called 911 at 10:13 a.m. Personnel from the Marion County Sherriff's Office, Puckett Ambulance Service, and Larry Guess, Marion County Medical Death Investigator, arrived at the mine at 10:40 a.m. Guess pronounced Ortiz's time of death as 10:00 a.m.

INVESTIGATION OF THE ACCIDENT

On April 10, 2023, at approximately 12:45 p.m., Randall Dye, Mine Safety and Health Training Specialist, was notified by a local resident of the fatal accident. Dye contacted Ryan O'Boyle, Supervisory Mine Safety and Health Inspector, who notified Craig Plumley, Assistant District Manager. Plumley notified Samuel Creasy, District Manager, and assigned Phillip Carter, Mine Safety and Health Inspector, as the accident investigator. At 1:30 p.m., Carter arrived at the mine and issued an order under the provisions of Section 103(k) of the Mine Act to ensure the safety of the miners and preservation of evidence.

Carter conducted an examination of the accident scene, interviewed miners and mine management, and reviewed conditions and work procedures relevant to the accident. See Appendix B for a list of persons who participated in the investigation.

DISCUSSION

Location of the Accident

The accident occurred at the outdoor staging area where miners conduct equipment repairs (see Appendix C).

Weather

The weather at the time of the accident was 57 degrees Fahrenheit with cloudy skies. The investigator determined that weather did not contribute to the accident.

Equipment Involved

The tires being mounted were regrooved Firestone T831 Radials manufactured in 2006 for use on a five-ton 6x6 military dump truck. The rims used for mounting the tires were two-piece, 20-inch by 7.5-inch wheel rims with a lock ring that locks into a groove in the rim (see Appendix D). The identification markings on the rim were not legible, so the manufacturer could not be determined.

At MSHA's request, the mine operator contacted Carlton Brown, Owner of Brothers Road Service, to examine the rim and wheel assembly involved in the accident. Brown is a local tire technician familiar with this type of rim and wheel assembly. Upon examination, Brown and Carter observed the following deficiencies and improper assembly procedures. These findings were corroborated with recommendations found in industry standard manuals, "TOPY Industries, Limited, Multi-piece Rims for Industrial and Construction Wheels Vehicles (RIM INSTRUCTION MANUAL)" and "GKN- Wheel & Rim Safety Manual."

1. The rims were not verified to be compatible before mounting the tires. The manufacturer's markings on the rims were illegible and could not be verified. If the markings on any rim component cannot be determined, the part should be discarded.

2. Rust and rounded edges were observed on the interior of the lock ring, which prevented the lock ring from properly seating on the rim. Inconsistent gaps were observed around the circumference of the lock ring indicating it was not properly seated against the rim.

A wire brush or grinder should have been used to remove the rust and rounded edges on the lock rings before assembly.

3. Damaged rim components that should have been discarded were used in mounting the tires. The ends of the lock ring were warped and distorted. The ends of the lock ring did not sit flat against the rim, preventing it from properly seating.

4. Improper tools were used while mounting the tires to the rims. Hammer marks were observed on the rims resulting in distortion of the locking mechanism. Only a proper rim mallet should have been used during the assembly.

5. No lubrication was used on the rim before mounting the tire. An approved non-petroleum-based lubricant should be applied to the bead seat area, tire beads, tire flap, and other rim-to-tire contact surfaces just before mounting the tire.

6. Proper procedures for inflation of the tires were not followed. The tire assembly was not placed in a restraining device to eliminate hazards associated with an explosive separation of the rim. The tires were inflated to 70 psi. The tires should have only been inflated to a maximum of 40 psi to seat the tire beads. Since the tires were not intended to be used immediately, the pressure should have then been reduced to 10 psi for storage.

The investigator determined that these defects were obvious and contributed to the accident. Sales-Vasquez did not perform a thorough examination of the rim before attempting to mount the tires. Sales-Vasquez should have been aware of the serious safety defects on the rim and should have taken corrective action to prevent the creation of a hazard to miners. During interviews, Sales-Vasquez stated that he should have removed the rust before using the rims. Sales-Vasquez also stated he was going to order a tire cage (restraining device) because he recognized the need, following this accident.

Examinations

The mine operator did not conduct a workplace examination on the day of the accident. The lack of a workplace examination did not contribute to this accident.

Training and Experience

Ortiz had approximately ten years of mining experience at various mines. According to interviews, Ortiz had assisted Sales-Vasquez in mounting tires on these types of rims multiple times over the past ten years. However, Sales-Vasquez said he didn't know what training Ortiz had in mounting tires onto rims. When asked by the accident investigator, Sales-Vasquez did not state all of the necessary steps to safely mount tires onto rims. There was no Part 46 training plan for this mining operation and no documentation of training in accordance with MSHA Part 46 training regulations that could be provided during the investigation. The investigator determined that the lack of task training contributed to the accident.

ROOT CAUSE ANALYSIS

The accident investigator conducted an analysis to identify the underlying causes of the accident. The accident investigator 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 correct defects on rims that affected safety to prevent the creation of a hazard to miners.

   Corrective Action: The mine operator removed all two-piece wheel rims with lock rings from the mine. All wheel assembly will be conducted by a tire technician off mine property. The mine operator adopted this policy in their Part 46 Training Plan.

2. Root Cause: The mine operator did not provide task training for mounting tires on rims.

   Corrective Action: The mine operator removed all two-piece wheel rims with lock rings from the mine and only one-piece wheel rims will be used at the mine. Additionally, all wheel assembly will be conducted by a tire technician off mine property. The mine operator adopted this policy in their Part 46 Training Plan.

3. Root Cause: The mine operator did not notify MSHA when mining commenced.

   Corrective Action: The mine operator has officially notified MSHA of the commencement of operations and MSHA will continue to inspect the mine in accordance with the Mine Act.

CONCLUSION

On April 9, 2023, Filemon Ortiz, a 63 year-old laborer with approximately ten years of mining experience, died while mounting off-road truck tires on two-piece wheel rims with lock rings (rims). The lock ring from one of the assembled rims dislodged, causing the lock ring to propel into the air and strike Ortiz.

The accident occurred because the mine operator did not: 1) correct defects on rims that affected safety to prevent the creation of a hazard to miners, 2) provide task training for mounting tires on rims, and 3) notify MSHA when mining commenced.

Approved by:

_____ _____

Samuel Creasy Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) order was issued to South Pittsburg Stone.

   A fatal accident occurred on April 9, 2023, at approximately 10:00 a.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 approval of an authorized representative of MSHA of any plan to recover any person in the mine or to recover the mine or affected area. This order prohibits any activity in the 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(a) citation was issued to South Pittsburg Stone for a violation of 30 CFR 56.14100(b).

   A fatal accident occurred on April 9, 2023, when a laborer died while mounting off-road truck tires on two-piece wheel rims with lock rings (rims). The lock ring from one of the assembled rims dislodged, causing the lock ring to propel into the air and strike the laborer. The laborer and a foreman were working together to inflate a tire onto a rim. The foreman did not correct the safety defects of the rim before attempting to mount the tire. The foreman should have been aware of the obvious safety defects and should have taken corrective action to prevent the creation of a hazard to miners. The deficiencies and improper assembly procedures observed were as follows:

   1. The rims were not verified to be compatible before mounting the tires. The manufacturer's markings on the rims were illegible and could not be verified. If the markings on any rim component cannot be determined, the part should be discarded.

   2. Rust and rounded edges were observed on the interior of the lock ring, which prevented the lock ring from properly seating on the rim. Inconsistent gaps were observed around the circumference of the lock ring indicating it was not properly seated against the rim. A wire brush or grinder should have been used to remove the rust and rounded edges on the lock rings before assembly.

   3. Damaged rim components that should have been discarded were used in mounting the tires. The ends of the lock ring were warped and distorted. The ends of the lock ring did not sit flat against the rim, preventing it from properly seating.

   4. Improper tools were used while mounting the tires to the rims. Hammer marks were observed on the rims resulting in distortion of the locking mechanism. Only a proper rim mallet should have been used during the assembly.

   5. No lubrication was used on the rim before mounting the tire. An approved non-petroleum-based lubricant should be applied to the bead seat area, tire beads, tire flap, and other rim-to-tire contact surfaces just before mounting the tire.

6. Proper procedures for inflation of the tires were not followed. The tire assembly was not placed in a restraining device to eliminate hazards associated with an explosive separation of the rim. The tires were inflated to 70 psi. The tires should have only been inflated to a maximum of 40 psi to seat the tire beads. Since the tires were not intended to be used immediately, the pressure should have then been reduced to 10 psi for storage.

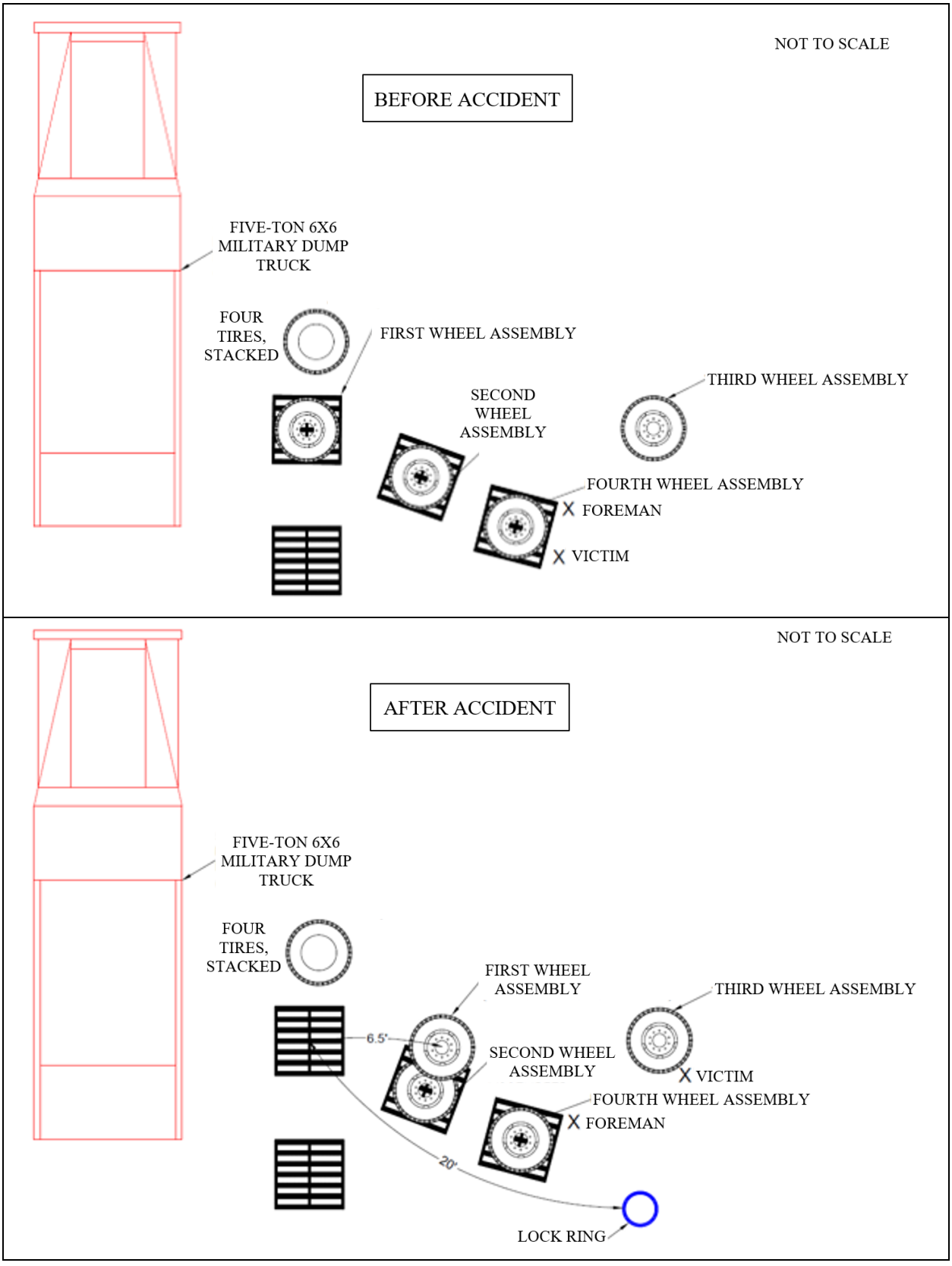
3. A 104(a) citation was issued to South Pittsburg Stone for a violation of 30 CFR 46.7(b).

   A fatal accident occurred on April 9, 2023, when a laborer died while mounting off-road truck tires on two-piece wheel rims with lock rings (rims). The lock ring from one of the assembled rims dislodged, causing the lock ring to propel into the air and strike the laborer. The laborer and a foreman were working together to inflate a tire onto a rim. The mine operator could not produce to MSHA documentation of any type of training for the victim as required by Part 46, including task training.

4. A 104(d)(1) order was issued to South Pittsburg Stone for a violation of 30 CFR 56.1000.

   A fatal accident occurred on April 9, 2023, when a laborer died while mounting off-road truck tires on two-piece wheel rims with lock rings (rims). The lock ring from one of the assembled rims dislodged, causing the lock ring to propel into the air and strike the laborer. The mine operator did not notify the nearest MSHA office of commencement of mining operations prior to the start of mining. The mine has been in operation approximately 12 months in this location. The mine operator legally operated a mine at a different location that was abandoned October 1, 2021, and was aware of MSHA's requirements. The mine operator engaged in aggravated conduct beyond ordinary negligence by not notifying MSHA of commencement prior to beginning work. This violation is an unwarrantable failure to comply with a mandatory standard.

APPENDIX A – Drawing of the Accident Scene



APPENDIX B – Persons Participating in the Investigation

South Pittsburg Stone

Julio Sales-Domingo	Owner
Virgilio Sales-Vasquez	Foreman
Juan Perez	Truck Driver
Enrique Simerez	Excavator Operator
Marvin Lopez	Stacker
Walter Lopez	Stacker
Ilario Vasquez	Stacker

Mossy Oak Properties Land Sales LLC.

Clint Carroll	Realtor

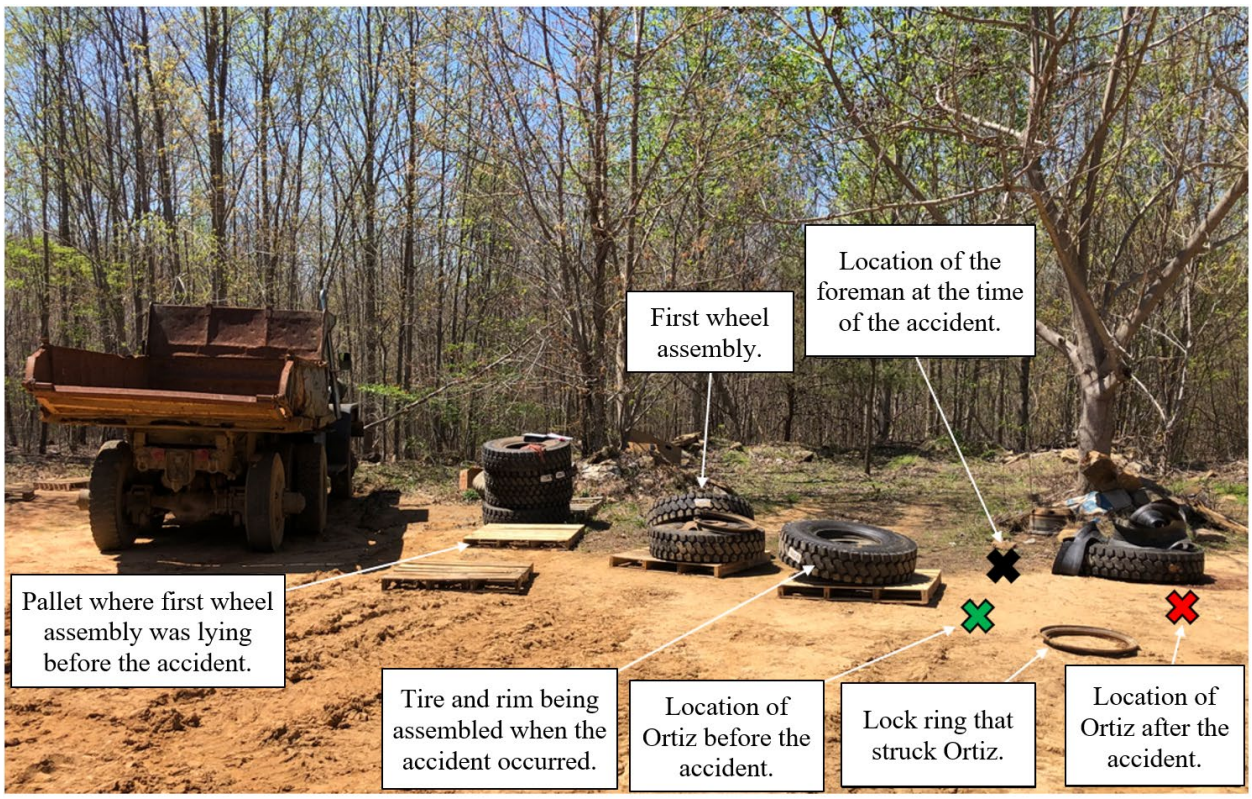
Brothers Road Service

Carlton Brown	Owner

Mine Safety and Health Administration

Samuel Creasy	District Manager
Craig Plumley	Assistant District Manager
Ryan O'Boyle	Supervisory Mine Safety and Health Inspector
Ronald Caudill	Mine Safety and Health Specialist
Phillip Carter	Mine Safety and Health Inspector
Otis Carroll	Mine Safety and Health Inspector

APPENDIX C – Photograph of Accident Scene



APPENDIX D – Two-Piece Wheel Rim with Lock Ring Defects