

UNITED STATES  
DEPARTMENT OF LABOR  
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Fall of Roof Accident  
December 16, 2009

Sapphire Coal Company  
Sandlick II Mine  
Sandlick, Letcher County, Kentucky  
I.D. No. 15-18782

Accident Investigator

Darrell E Hurley  
Roof Control Specialist

Originating Office  
Mine Safety and Health Administration  
District 6  
100 Fae Ramsey Lane  
Pikeville, KY 41501  
Norman G. Page, District Manager

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Photo of Accident Scene

## OVERVIEW

At approximately 8:40 p.m., on Wednesday, December 16, 2009, Phillip Newton, a 34-year old continuous mining machine operator for Sapphire Coal Company, received fatal injuries when a piece of rock measuring 13 feet long by 6 feet wide by 12 to 16 inches thick fell from the roof and trapped Newton (victim) beneath it. The victim was cutting the No. 5 Right crosscut into the No. 6 entry (see Sketch of Accident Scene).

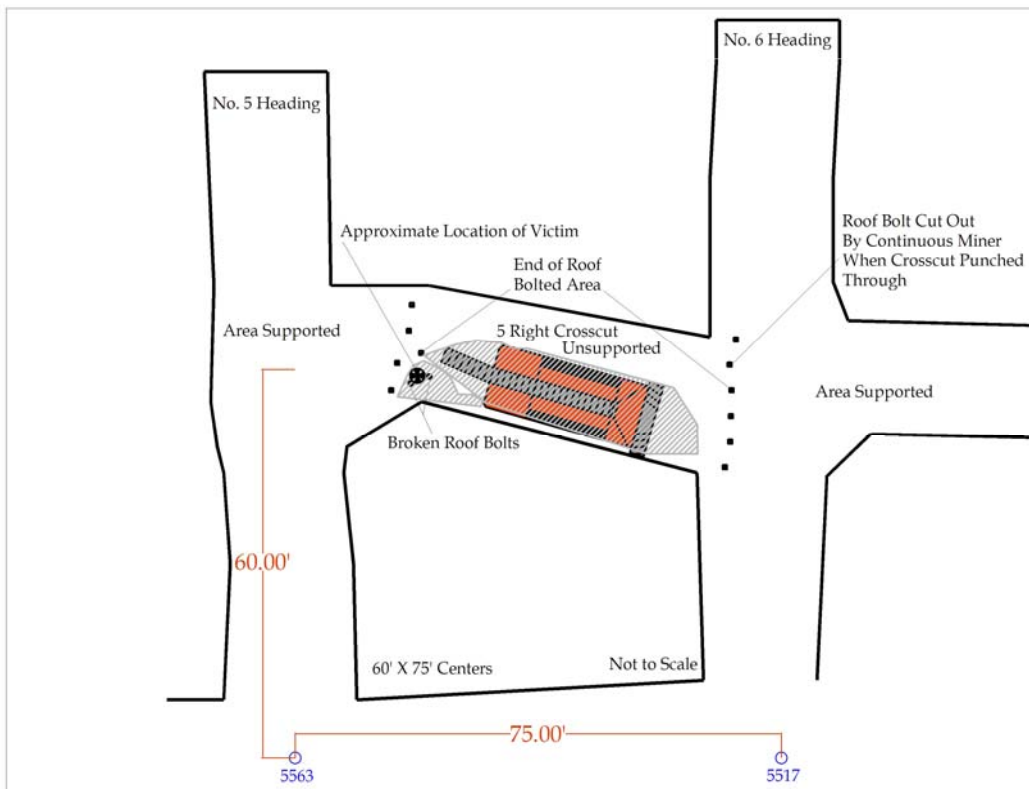
The accident occurred because the operator failed to follow the approved roof control plan. Adverse roof conditions were present. Instead of following the plan and reducing the mining cut depth to 20 feet or less, the cut depth was increased to 49 feet. This was 9 feet longer than the maximum cut depth in the plan.

## GENERAL INFORMATION

Sapphire Coal Company, Sandlick II, is an underground bituminous coal mine located at Sandlick, Letcher County, Kentucky. The parent company is Metinvest B V.

The principal officers of Sapphire Coal Company are John Schroeder, President, and Everett Kelly, Superintendent. The mine operates two nine-hour shifts per day, 5 days per week and employs 51 persons. The mine produces approximately 1,267 tons of coal per day.

The last regular safety and health inspection (E01) of the mine prior to the accident was completed on September 30, 2009. The Non-Fatal Days Lost (NFDL) injury incidence rate at this mine prior to the accident was 0.00 compared to a national NFDL rate of 4.16.



Sketch of Accident Scene

### DESCRIPTION OF ACCIDENT

On Wednesday, December 16, 2009, the second shift began at 3:15 p.m. Israel Clark, Section Foreman, was instructed by Lee Roy Combs, Day Shift General Mine Foreman, to mine the crosscuts only, except the No. 2 and No. 3 entries could be mined for a distance of one cut each. The 12 man crew traveled underground to the working section and relieved the day shift crew on the section. This section had two continuous mining machines that alternated operation during the shift. A cut is taken on the left side of the section and when completed, the continuous mining machine on the right side of the section takes a cut. Second shift mining began on the left side of the section in the No. 3 entry. The first cut on the right side was the No. 6 Right crosscut, where

one cut had previously been mined. The victim was operating the right side continuous mining machine. This cut went through into the No. 7 entry. After cutting through, the right side mining machine was moved to the last open crosscut in order to be serviced. Danny Morales, Electrician, helped Newton clean the demister on the wet bed scrubber. Newton asked Clark if they could cut the headings and Clark informed Newton he was instructed by Combs earlier to cut crosscuts only, except for the No. 2 and No. 3 entries, where they could take one cut. The right side mining machine was set up to start the No. 5 Right crosscut by around 7:00 pm. Clark traveled to No. 5 Right crosscut to get the mid-shift report on footage mined. Newton informed Clark he had mined approximately 30 feet on the right side and 25 feet on the left side of the current cut. Newton stated he had been having trouble mining this cut because it was rolling and dipping toward the right side of the crosscut. After Clark left, Newton continued mining the cut.

Kenny Crase, Ram Car Operator had backed up to let Newton reposition his continuous mining machine from the left side to the right side. Crase could not see Newton from his position, but he saw a metal strap pull down from the roof and a small piece of rock fall. He then heard the pump motor on the continuous mining machine shut off. Crase called out for Newton, but did not receive a response and exited his ram car. Crase walked up and observed rock on the continuous mining machine, and rock lying where Newton should have been located. Crase called out for someone to help Newton.

Danny Morales, French Holbrook, Johnnie Sandlin and Larry Stamper were located at the emergency sled when they heard the rock fall. They traveled up the No. 6 entry where Morales saw the rock on the front of the continuous mining machine. Sandlin went to inform Clark that the No. 5 Right crosscut had fallen in and they could not find Newton. Morales, Holbrook, and Stamper then traveled back around the coal pillar to the No. Five Right crosscut and saw what appeared to be Newton's hard hat under the rock.

Clark traveled to the emergency telephone where he called Doug Benton, Second Shift Mine Foreman. He informed Benton of the fall at No. 5 Right crosscut and that no one could locate Newton. Benton said he would travel to the section. Clark traveled back to the accident location. Holbrook went to the emergency sled, where he loaded timbers and wooden crib blocks into the scoop bucket in order to secure the accident scene and perform recovery. The crew started setting timbers around the edge of the fall. Holbrook operated the scoop with its bucket to raise the rock. Newton was observed under the rock. Benton arrived and shortly thereafter, Ed Banks, Company Safety Inspector and Mike Eldridge, Inspector for the Kentucky Office of Mine Safety and Licensing, arrived. The rock was raised and supported with wooden crib blocks. Newton was moved to the first outby crosscut between No. 5 entry and No. 4 entry. Newton had no vital signs and he was placed on a backboard and transported to the surface.

When Newton arrived on the surface he was examined by Wallace Bolling Jr., Letcher County Corner, and pronounced dead at 11:45 p.m.

## **INVESTIGATION OF ACCIDENT**

The MSHA Call Center was notified of the accident at 8:55 p.m. Coal Mine Safety and Health Supervisor, James Hager telephoned Sapphire Coal Company, Sandlick II Mine and issued a 103(j) Order verbally to Ed Banks, Safety Inspector. MSHA personnel were immediately dispatched to the scene and the 103(j) Order was formally issued in writing and modified to a 103(k) Order to ensure the safety of all persons at the mine. The investigation was conducted in cooperation with the Kentucky Office of Mine Safety and Licensing (KYOMSL).

Photographs and relevant measurements were taken of the accident scene. A review of the training records was conducted. Interviews were conducted with 20 employees of Sapphire Coal Company. The interviews were conducted at the MSHA Whitesburg Field Office on December 18, 21, 22, 2009, and January 25, 2010.

## **DISCUSSION**

### **Section Development**

The Four East Panel had been developed on 60 foot minimum entry centers and 75 foot minimum crosscut centers in accordance with the approved roof control plan (see Appendix A).

It was decided by the mine superintendent and mine management to mine rooms off the right side of the Four East panel for a distance of approximately four crosscuts and then pillar the area without changing the orientation of the coal pillars. The mine engineering department, safety department, and the operation president were consulted and agreed with the change. Maps with the revised projections were printed and posted at the mine. The rooms to be driven on retreat of Four East panel were projected to be 75 feet entry centers and 60 feet crosscut centers. The approved roof control plan required a minimum of 60 feet entry centers. The orientation of the blocks caused the entry centers to be 75 feet making the width of the block along the crosscut to be 55 feet instead of 40 feet. The miners were accustomed to cutting the 40 feet wide block through in two cuts. When a turn-in is made, three cuts are required to cut through the 55 feet wide blocks in order to comply with the approved roof control plan.

## **Roof Control**

The approved roof control plan, dated March 4, 2009, specified that a minimum of a five foot long, fully grouted resin roof bolt be installed on four foot centers for primary roof support.

Supplemental roof support of four, eight foot cable bolts to be installed in the intersections was required for areas to be second mined (pillared). The rooms which were being developed off Four East panel at the accident location were developed by the operator with the intention to be pillared.

The minimum entry centers for mining rooms were 60 feet and the minimum crosscut centers for rooms was 75 feet.

The maximum allowed extended cut depth was 40 feet. When subnormal or adverse conditions were encountered, the depth of the cut was required to be reduced to 20 feet or less. The safety precautions for mining an extended cut required the continuous mining machine operator to not expose any portion of his body in by the second row of undisturbed permanent supports.

The Five Right crosscut where the accident occurred had the first cut (turn-in) mined on the day shift and was supported with five foot, 5/8 inch diameter resin grouted bolts. Metal roof straps had been installed perpendicular to the entry on four rows of roof bolts in the turn in and on three rows of roof bolts in the intersection before the crosscut was started. The metal straps were installed to provide supplemental roof support due to the presence of a sandy slicken-side that created a weak plane in the roof. The installation of metal straps was evidence of the roof bolting machine operators recognizing that the slicken-side area was an adverse roof condition. The crosscut was elevated slightly uphill and dipped downward to the right side. At mid-shift, Newton informed Clark that he had been having trouble with the cut being mined because the crosscut was dipping to the right side. The dip of the seam caused the continuous mining machine to drift to the right, rounding the crosscut back into the pillar block. It also caused the roof to be cut unevenly, with the left side being cut upward into the slicken-side plane at the left rib line. The cut depth was not reduced to 20 feet or less when adverse roof conditions were encountered, as required in the approved roof control plan.

## **Excessive Cut Depth**

The cut depth from the last row of primary support in the No. 5 Right crosscut to the first row of roof bolts in the No. six entry was measured to be approximately 49 feet. The maximum cut depth allowed by the approved roof control plan was 40 feet.

## **Position of the Continuous Mining Machine Operator**

Newton's body was located under the fallen rock between the first and second row of roof bolts. Two roof bolts in the first row were broken and portions were in the rock which had fallen. A visual warning device was hanging on the roof bolt furthest outby, which was in the second row of installed roof bolts from the newly mined, unsupported area.

## **Examination**

Three metal straps had been installed in the No. 5 entry when the entry was developed. When the turn-in for the No. 5 Right crosscut was bolted, four roof straps were installed perpendicular to the crosscut. One was installed at the slicken-sided fault. The second shift foreman traveled to this location before the continuous mining machine was positioned into the place and again at mid-shift report time. Newton had cut 30 feet on the right side and 25 feet on the left side. The second shift foreman did not identify the adverse roof conditions and did not instruct the continuous mining machine operator to reduce the cut depth because of the adverse conditions.

## **Training**

Training records were checked and found to be up to date for all employees.

## **ROOT CAUSE ANALYSIS**

An analysis was conducted to determine the most basic causes of the accident. Listed below are the root causes identified during the analysis and the corresponding corrective actions implemented to prevent a recurrence of the accident.

*Root Cause:* Administrative controls, policies, and procedures were not utilized by the operator to ensure compliance with the approved roof control plan when it changed the orientation of the coal pillars that were going to be mined without prior MSHA approval.

*Corrective Action:* The operator has discontinued mining the rooms off 4 East panel where the block orientation had been reversed.

*Root Cause:* The operator did not reduce the cut depth to 20 feet or less where an adverse roof condition in the form of a sandy, slicken-side area was present. The approved roof control plan required the cut depth to be reduced to 20 feet or less where adverse or subnormal roof conditions were encountered.



Corrective Actions: The approved roof control plan has been revised to specify a maximum of 20 feet cut depth in crosscuts and 30 feet cut depth in entries. The miners and management have been re-trained in the revised roof control plan to reduce cut depth under adverse roof conditions.

Root Cause: An extended cut was mined in excess of the approved 40 feet. The cut depth measured approximately 49 feet.

Corrective Actions: The operator has retrained the miners in the revised maximum cut depth allowed by the approved roof control plan. The maximum cut depth was reduced to 30 feet in entries and maximum of 20 feet in crosscuts. All persons were trained in the revised roof control plan and a depth indication mark was provided on the continuous mining machine for reference. Also, a letter from the mine President has been posted on the mine bulletin board, stating that all miners are to follow the approved roof control plan at all times.

Root Cause: The continuous mining machine operator was not positioned outby the second row of undisturbed roof support while mining an extended cut. The machine operator was located between the first and second row of installed permanent support while mining an extended cut.

Corrective Actions: All persons were retrained in the requirements of the approved roof control plan. The safety precautions were reviewed for mining extended cuts, including the safe location of the continuous mining machine operator.

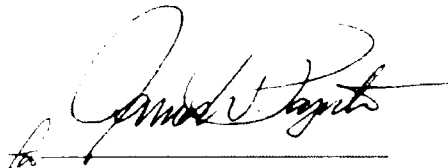
Root Cause: An inadequate on shift examination was conducted by the section foreman. Adverse roof conditions in the form of a sandy, slicken-side area existed in the area and had been supported with metal straps during the previous shift. The foreman was in the area where the accident occurred twice during the shift. The installation of straps in the area, the conversation with the mining machine operator having difficulty mining this cut, and the foreman's visual observations should have resulted in the foreman directing Newton to reduce the cut depth.

Corrective Actions: The operator has trained their supervisory personnel to examine the mine roof for adverse geological conditions and to reduce the cut depth when adverse roof conditions are present.

## CONCLUSION

The accident occurred because the operator did not take the necessary steps to prevent these conditions: The rooms that were driven on the right side of Four East Panel on retreat were not oriented on 60 foot minimum entry centers and 75 foot minimum crosscut centers, as required in the approved roof control plan. Adverse roof conditions were present in the No. 5 Right crosscut and the cut depth was not reduced to 20 feet or less, as required in the approved roof control plan. The cut depth taken was in excess of 40 feet, the maximum allowed by the approved roof control plan. The continuous mining machine operator was not positioned outby the second row of permanent roof bolts being used for primary support while mining an extended cut.

Approved by:

  
\_\_\_\_\_  
Norman G. Page  
District Manager

4-23-2010  
\_\_\_\_\_  
Date

## ENFORCEMENT ACTIONS

1. A 103 (j) Order, No. 6661224 was issued on December 16, 2009, to Sapphire Coal Company to assure the safety of all persons at the mine. The order was modified later to a 103(k) Order

Condition or Practice: "This mine has experienced a roof fall accident at the mine on the MMU 001 section. This order is issued to assure the safety of any person at the coal mine until an examination or investigation is made to determine the mine is safe. Only those persons selected from company officials, state officials, the miners' representative and other persons who are deemed by MSHA to have information relevant to the investigation may remain in the affected areas."

2. A 104(d) (1) Order, No. 8218166 was issued for a violation of 30 CFR § 75.220 (a) (1) for failure to comply with the approved roof control plan.

Condition or Practice: The approved roof control plan was not being complied with on MMU 001. Pillaring had stopped in the Four East panel to develop rooms to the right. The approved roof control plan, dated March 4, 2009, required that only a minimum 60 foot entry centers and a minimum 75 foot crosscut centers be used in all phases of mining. The operator engaged in aggravated conduct, constituting more than ordinary negligence, by developing these rooms on 75 foot entry centers and 60 foot crosscut centers. The orientation of these blocks violated the minimum crosscut centers. This caused the crosscut centers to be less than the minimum 75 feet allowed in the approved roof control plan. This also caused the distance through the crosscut to change from 40 feet to 55 feet, causing deeper cuts to be taken to complete the cuts through. It normally took two cuts to put the crosscuts through on 60 foot centers and they were mining the 75 foot crosscuts centers through with two cuts. This violation is an unwarrantable failure to comply with a mandatory standard.

3. A 104(d) (1) Order, No.8218167 was issued for a violation of 30 CFR § 75.220 (a) (1) for failure to comply with the approved roof control plan.

Condition or Practice: The approved roof control plan was not being complied with on the MMU 001. The operator engaged in aggravated conduct, constituting more than ordinary negligence, by mining the right crosscut developed off the No. 5 entry through into the No. 6 entry for a distance of approximately 49 feet from the last row of installed roof bolts in the No. 5 Right crosscut, to the first row of installed roof bolts from the rib line of the No. 6 entry. When conducting a cut through, the cut depth is measured as the distance from the last row of installed permanent roof supports in the crosscut to the point that the roof is permanently supported by installed permanent roof support in the entry being cut in to. The approved plan allowed a maximum extended cut distance

of 40 feet. This violation is an unwarrantable failure to comply with a mandatory standard.

4. A 104(d) (1) Order, No. 8218168 was issued for a violation of 30 CFR § 75.220 (a) (1) for failing to comply with the approved roof control plan.

Condition or Practice: The approved roof control plan was not being complied with on the MMU 001. Page 16, item 14 stated, "when subnormal or adverse roof conditions are encountered, the cut depth will be limited to 20 feet or less." Subnormal or adverse conditions had been encountered and roof straps had been installed on the day shift on the last four rows of roof bolts used for primary support. The foreman was in the area during the cut and discussed the conditions with the mining machine operator. He engaged in aggravated conduct by failing to direct the operator to reduce the cut depth to 20 feet or less. This violation is an unwarrantable failure to comply with a mandatory standard.

5. A 104(a) Citation, No. 8218169 was issued for a violation of 30 CFR § 75.220 (a) (1) for failure to comply with the approved roof control plan.

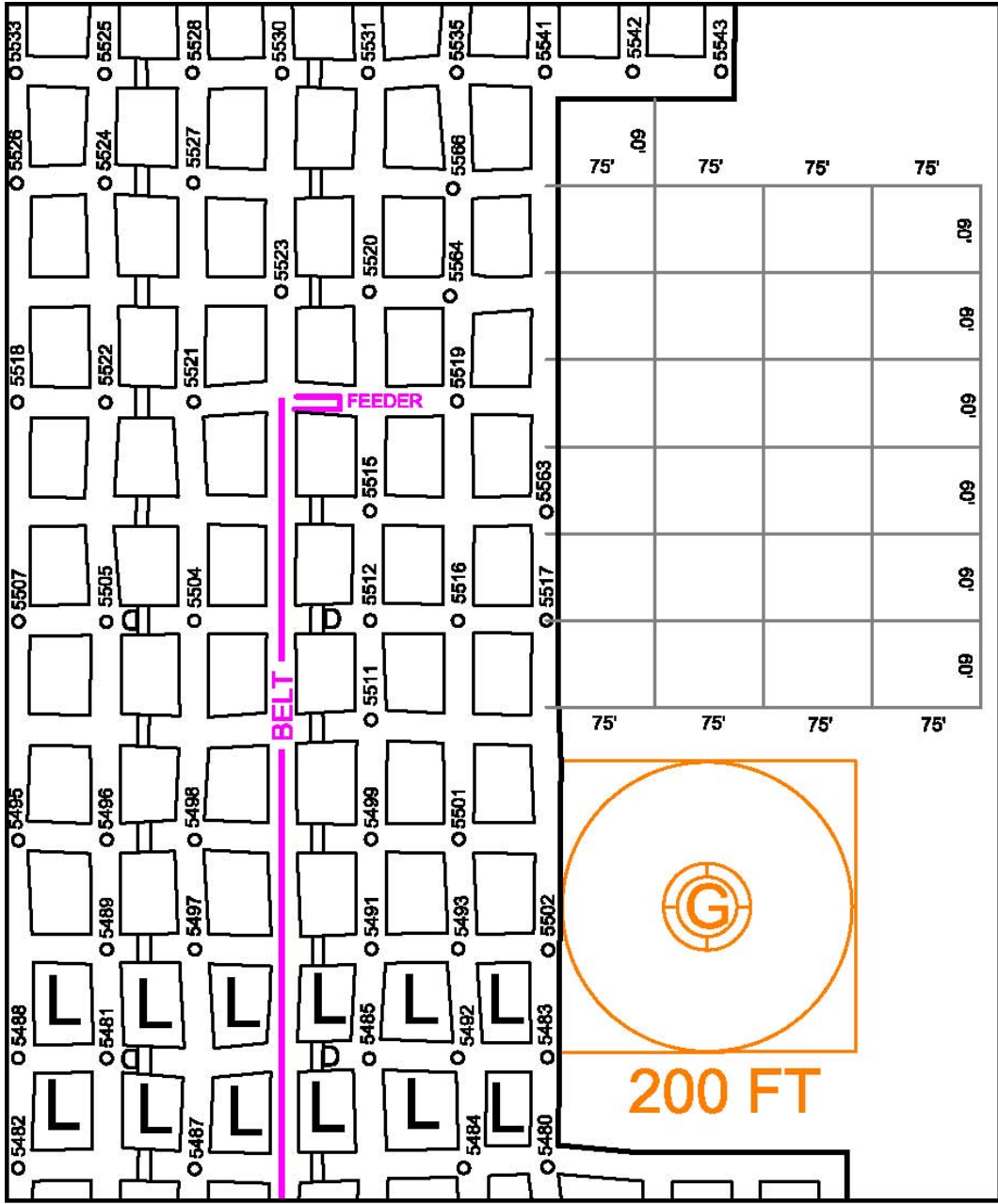
Condition or Practice: The continuous mining machine operator had cut Five Right crosscut into No. six entry while taking an extended cut and positioned himself between the first and second row of permanent roof support. The approved roof control plan stated on page 15, Item 3 that "the continuous mining machine operator and other persons in the area shall not expose any portion of their body in by the second row of undisturbed permanent roof supports."

6. A 104(d) (1) Order, No. 8218170 was issued for a violation of 30 CFR § 75.362 (a) (1) for an inadequate workplace examination being conducted on the MMU 001.

Condition or Practice: An inadequate on shift examination of the No. 5 entry, leading toward the No. six entry, was conducted by the evening shift foreman on December 16, 2009. The foreman traveled to the No. 5 Right crosscut while the mining machine operator was making the cut and the machine operator discussed with the foreman that he had been having trouble with the cut. Metal roof straps had been installed on the day shift this day and were present before the continuous mining machine started the cut. The foreman engaged in aggravated conduct by failing to identify the hazard and instruct the continuous miner operator to reduce the cut depth or move out of the area. This violation is an unwarrantable failure to comply with a mandatory standard.

Appendix A

Not to Scale

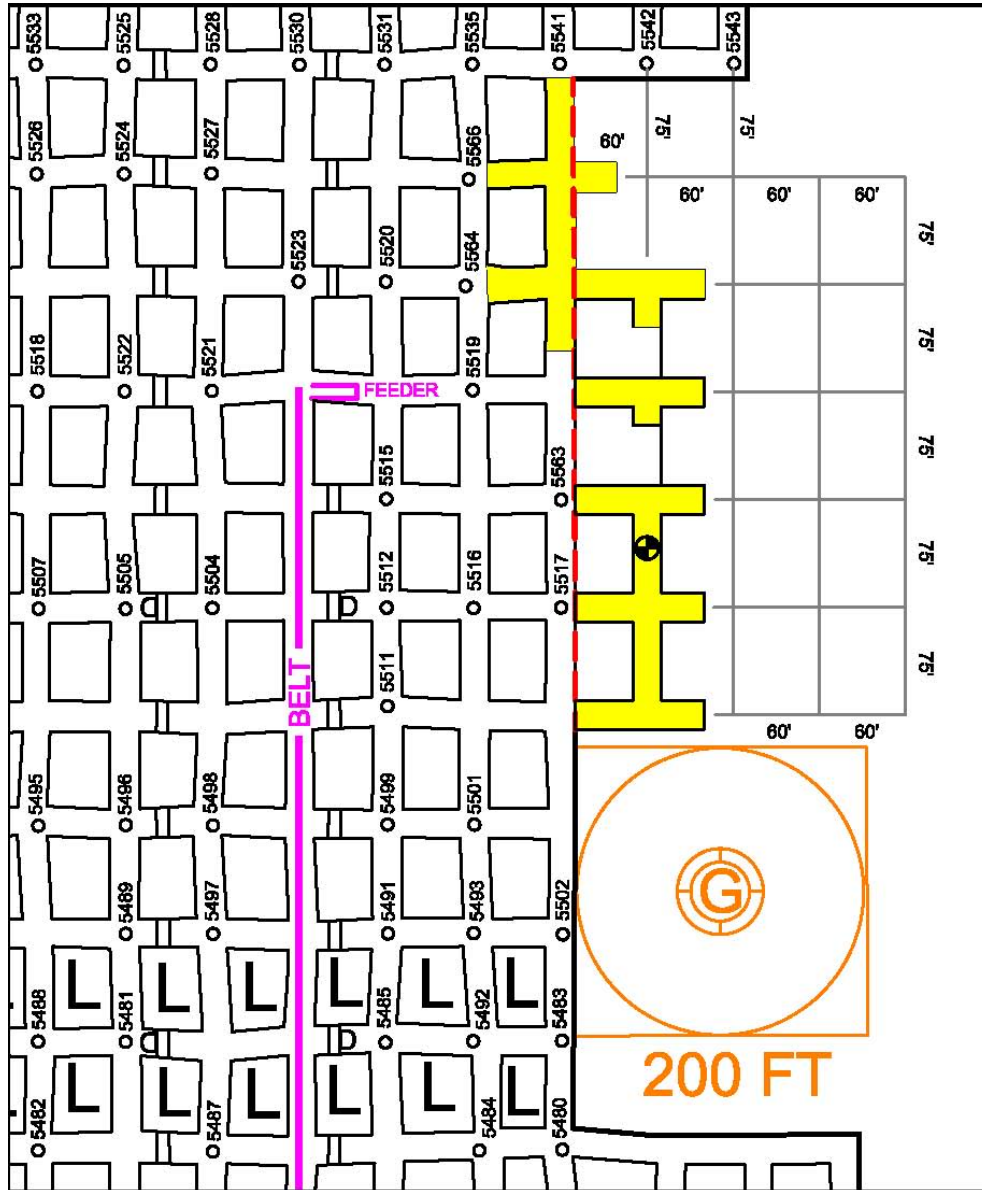


Orientation of Blocks as Approved in the Roof Control Plan

Appendix A

Sketches of Projections (continued)

Not to Scale



Orientation of Blocks as Designed by the Company

⊕ Accident Location

■ Area not mined on advanced.  
■ Area developed after pillaring had stopped.

## Appendix B

### List of Persons Interviewed

#### Sapphire Coal Company

James Everett Kelly	Superintendent
G. Fred Webb	Chief Engineer
Andy L. Fields	Manager of Safety & Human Resources
Travis F. Webb	Mine Engineer
Doug Benton	Second Shift General Mine Foreman
Hal Woody Adams	Day Shift Section Foreman
Israel Clark	Section Shift Section Foreman
Christopher Sturgill	Roof Bolter Operator
Daniel Baker	Mining Machine Operator
French P. Holbrook	Scoop Operator
Charles D. Stallard	Roof Bolt Operator
Bill E Holbrook	Roof Bolt Operator
Robbie Collins	Ram Car Operator
Kenny W. Crase	Ram Car Operator
Matthew R. Mullins	Ram Car Operator
Daniel Morales	Section Electrician / MET
Ricky G. Adams	Roof Bolt Operator
Sean Hall	Mining Machine Operator
Larry Stamper	Roof Bolt Operator
Johnnie Sandlin	Roof Bolt Operator
Lee Roy Combs	Day Shift Mine Foreman

## APPENDIX C

### List of Persons Participating in the Investigation

#### Kentucky Office of Mine Safety and Licensing

David Mullins	Hazard District Supervisor
Tracy Stumbo	Chief Accident Investigator
Tim Fugate	Accident Investigator
Michael Eldridge	Roof Control Inspector
Bob Banks	Inspector Principal
Daniel Bentley	Underground Safety Analyst

#### Mine Safety and Health Administration

David Ison	Supervisory Coal Mine Inspector
Darrell Hurley	Roof Control Specialist / Accident Investigator
David Steffey	Mining Engineer/Accident Investigator
Kenneth Fleming	Coal Mine Inspector/Accident Investigator
Robert Bellamy	Staff Assistant/Accident Investigation Coordinator
Chris Barber	Attorney
James Newman	Coal Mine Inspector/Accident Investigator
Donny Young	Roof Control Specialist
George Mann	Roof Control Specialist
Jeffrey Miles	Roof Control Specialist
Jerry Bellamy	Mine Engineer/ Ventilation Specialist
Greg Hall	Civil Engineer



## APPENDIX D

### Victim Information

Accident Investigation Data - Victim Information

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



Event Number: 

4	2	0	2	5	9	0
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<b>Victim Information: 1</b>																										
1. Name of Injured/Ill Employee: <i>Phillip Newton</i>				2. Sex <i>M</i>		3. Victim's Age <i>34</i>		4. Last Four Digits of SSN: <i>5691</i>				5. Degree of Injury: <i>01 Fatal</i>														
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 12/16/2009 b. Time: 20:50</i>								7. Date and Time Started: <i>a. Date: 12/16/2009 b. Time: 15:15</i>																		
8. Regular Job Title: <i>036 Continuous Miner Operator</i>						9. Work Activity when Injured: <i>049 Operate Continuous Miner</i>						10. Was this work activity part of regular job? <table style="width: 100%;"><tr><td style="text-align: center;">Yes</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;">No</td><td style="text-align: center;"><input type="checkbox"/></td></tr></table>				Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>							
Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>																							
11. Experience		Years	Weeks	Days	b. Regular		Years	Weeks	Days	c. This		Years	Weeks	Days	d. Total		Years	Weeks	Days							
a. This										c. This					d. Total											
Work Activity:		<i>3</i>	<i>10</i>	<i>0</i>	Job Title:		<i>3</i>	<i>10</i>	<i>0</i>	Mine:		<i>1</i>	<i>22</i>	<i>0</i>	Mining:		<i>14</i>	<i>0</i>	<i>0</i>							
12. What Directly Inflicted Injury or Illness? <i>090 Caving rock</i>								13. Nature of Injury or Illness: <i>170 Crushing</i>																		
14. Training Deficiencies: Hazard: <table style="display: inline-table; border: none;"><tr><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">New/Newly-Employed</td><td style="width: 100px; border: none;">Experienced Miner:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">Annual:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">Task:</td><td style="width: 100px; border: none;"></td></tr></table>																	New/Newly-Employed	Experienced Miner:		Annual:		Task:				
	New/Newly-Employed	Experienced Miner:		Annual:		Task:																				
15. Company of Employment:(If different from production operator) <i>Operator</i>												Independent Contractor ID: (if applicable)														
16. On-site Emergency Medical Treatment: Not Applicable: <table style="display: inline-table; border: none;"><tr><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">First-Aid:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">CPR:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">EMT:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">Medical Professional:</td><td style="width: 100px; border: none;"></td><td style="width: 100px; border: none;">None:</td><td style="width: 100px; border: none;"></td></tr></table>																	First-Aid:		CPR:		EMT:		Medical Professional:		None:	
	First-Aid:		CPR:		EMT:		Medical Professional:		None:																	
17. Part 50 Document Control Number: (form 7000-1)								18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>																		