

UNITED STATES  
DEPARTMENT OF LABOR  
MINE SAFETY AND HEALTH ADMINISTRATION  
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Mine  
(Crushed and Broken Granite)

Fatal Powered Haulage Accident  
November 7, 2013

Vulcan Construction Materials, L. P.  
Lithia Springs Quarry  
Lithia Springs, Douglas County, Georgia  
ID No. 09-00068

Investigators

Billy Randolph  
Supervisory Mine Safety and Health Inspector

Michael Evans  
Mine Safety and Health Specialist

Ronald Medina  
Mechanical Engineer

Norberto Ortiz  
Mine Safety and Health Specialist (Training)

Originating Office  
Mine Safety and Health Administration  
Southeastern District  
135 Gemini Circle, Suite 212  
Birmingham, Al 35209  
Samuel K. Pierce, District Manager



## OVERVIEW

On November 7, 2013, Carl J. Clinton, Haul Truck Operator, age 46, was killed while operating a haul truck that veered off the left side of a haul road and traveled through a berm. The haul truck went over an embankment and rolled on its side into a water filled settling pond.

The accident occurred due to management's failure to ensure that persons could safely operate mobile equipment. Investigators learned through interviews that Clinton was drowsy and was found sleeping during his shift; however, he continued to operate mobile equipment. The combination of alcohol and drugs found in the toxicology screening could account for the observed drowsiness displayed by the victim. Clinton was not wearing a seat belt.

## GENERAL INFORMATION

Lithia Springs Quarry, a surface crushed granite operation owned and operated by Vulcan Construction Materials L.P., is located on North County Line Road, Douglas County, Georgia. The principal operating official is Steve Collier, Plant Manager. The mine operates 2 eight hour shifts, five days a week. Total employment is 10 persons.

Granite is drilled and blasted using a multi-bench mining method from multiple pits. The material is loaded into haul trucks with a front-end loader and transported to a processing plant. Finished materials are sold for various uses in the construction industry.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on July 10, 2013.

## DESCRIPTION OF ACCIDENT

On the day of the accident, November 7, 2013, Carl J. Clinton (victim) began his shift about 2:46 p.m. Clinton parked his truck next to #57 bin and went into the control room. He started the bin feed which began filling #57 bin. This bin generally takes approximately one hour to fill.

At approximately 3:30 p.m., Robby Norton, Front-end Loader Operator, noticed #57 bin was over flowing. Norton entered the control room to shut down the feed for the bin. He saw Clinton slumped over in a chair with his feet in another chair. Norton stopped the bin feed and attempted to wake Clinton. Norton yelled and shook Clinton but he did not respond. Norton ran out of the control room and called out to Henry Kirby, Equipment Operator, as he was traveling by the control room.

Norton and Kirby went to Clinton and were able to awaken him. Clinton jumped to his feet and asked what was wrong. Kirby replied that #57 bin overflowed. Clinton said "I'll take care of it," grabbed his hardhat, and hurried to his truck. Norton saw Clinton attempting to back under #57 bin, using an approach angle that caused the truck to strike the bin structure several times. Clinton was finally able to get the truck under the bin and to fill it. Norton went back to his front-end loader after Clinton left with the loaded truck.

At approximately 4:00 p.m., Charles Havlik, Maintenance Repairman, was using a dozer at the secondary plant when Norton approached and told him what had happened with Clinton. He asked Havlik to convey the information to management. Havlik then told Steve Collier, General Superintendent, and Joseph Poole, Night Shift

Pit Foreman, what Norton had witnessed. At about 4:35 p.m., Collier was in the mine office when Norton reminded him to check on Clinton and Collier said he would do that.

Collier first saw Clinton about 4:45 p.m. at the wash bench where Clinton was shoveling material off a screen. Collier told Clinton he could go home if needed to. Clinton assured Collier he was okay and was not watching the bin when it overflowed. As Collier and Clinton came down the stairs of the wash bench, they met Poole. Collier, Poole, and Clinton talked for a few minutes, and then Clinton left in the haul truck to transport more rock to the stockpile. Collier discussed Clinton's actions with Poole and determined Clinton could continue to work.

At approximately 8:00 p.m., Clinton helped Ray Coulter, Leadman, adjust the feed on #28 chute and #29 chute. Coulter did not notice anything regarding Clinton's demeanor as they worked together. They finished about 8:15 p.m. Clinton got in the haul truck and continued hauling rock from the #57 bin to the stockpile. This was the last time anyone saw Clinton.

At approximately 9:00 p.m., Poole was traveling near the #57 stockpile area, when he saw a blinking light in the area of the settling ponds. Poole went to the area and saw Clinton's haul truck partially submerged in the settling pond. He made a phone call to Collier at 9:08 p.m. and reported the truck was in the settling pond and Clinton was missing. Poole called for Emergency Medical Services (EMS) at 9:10 p.m. and then went to the main gate to meet EMS and escort them to the accident scene. Collier called Wayne Hemmerich, Safety & Health Manager, to report the accident.

At 9:15 p.m., EMS arrived at the mine site. After determining the haul truck was stable, rescue personnel climbed onto the haul truck and located the submerged cab. They opened the right side door of the cab and located Clinton about 10:10 p.m. Clinton was pronounced dead at the scene by Nathan Mitchell, Douglas County Chief Deputy Coroner at 11:10 p.m. The cause of death was attributed to drowning.

## **INVESTIGATION OF ACCIDENT**

MSHA was notified of the accident on November 7, 2013, at 10:19 p.m. by a telephone call to the National Call Center from Wayne Hemmerich, Safety and Health Manager. The National Call Center notified Michael Evans, Mine Safety and Health Specialist, and an investigation was started the same day. MSHA issued an order pursuant to Section 103(j) of the Mine Act. Upon MSHA's arrival, the order was modified to section 103(k) of the Mine Act.

MSHA's accident investigation team traveled to the mine and conducted a physical inspection of the accident scene, interviewed employees, and reviewed conditions and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, and rescue agencies.

## DISCUSSION

### Location of the Accident

The accident occurred on the haul road between the #57 stockpile area and the plant. The haul truck was traveling from the stockpile area where the haul road turns to the right between two settling ponds. The haul truck's travel path was level. On the return trip the empty haul truck veered off the left side of the haul road and traveled through a berm. The haul truck went over an embankment and overturned onto its left side in a settling pond with the driver side door against the bottom of the pond. The weather was reported to be dry the night of the accident.

### PHYSICAL FACTORS

1) GENERAL MACHINE INFORMATION: The machine involved in the accident was a Caterpillar Model 769D, rigid frame, 40.6 ton rated payload capacity, off-highway truck. The truck was 26' 5" long, 14' 6" wide, and 13' 3" high. The truck was powered by a Caterpillar Model 3408E, 18.0 liter, turbocharged and aftercooled diesel engine. The Caterpillar rated maximum gross machine weight was 150,000 lbs. and the empty Caterpillar rated weight was approximately 68,900 lbs.

2) REPAIRS MADE TO ALLOW TESTING: After the truck was recovered from the settling pond, initial testing and evaluation was conducted in the "as found" condition. Later, damage caused by the accident was repaired to allow operational testing. Mine personnel replaced batteries and filters and the engine was rotated manually several full revolutions to purge it. The transmission controller behind the operator's seat was dried out and the water-damaged electronic transmission shift lever position sensor in the operator's compartment was replaced.

3) CATERPILLAR ELECTRONIC TECHNICIAN SERVICE TOOL: The truck was equipped with an onboard Caterpillar Electronic Technician (ET) diagnostic/service tool. Immediately after the truck was recovered from the water, engine and transmission data were retrieved using the Caterpillar data link system and displayed on a laptop computer. There were no active engine or transmission defect codes.

4) TRANSMISSION: The truck had an electronically controlled, automatic transmission with seven forward speeds, neutral, and one reverse. A single-lever shift control provided automatic shifting up to the one selected by the control lever.

The gear selector control was found in first gear and the internal rotary selector spool for the transmission was inspected and was also found to correspond to first gear. Investigators could not determine if the gear shift controller was bumped while the truck was still running as it entered the water.

5) HEADLIGHTS: After the truck was recovered, the headlight switch was found in the "ON" position. After new batteries were installed, all of the headlights functioned when the headlight switch was turned on.

6) STEERING SYSTEM DESIGN: The truck was equipped with a separate hydraulic system with a separate reservoir for the steering system. Twin, double acting cylinders acted to steer the wheels and the front suspension cylinders served as kingpins. Supplemental steering was provided by an automatic, electric-battery driven pump circuit. The supplemental steering system provided hydraulic pressure to steer the front wheels if normal flow from the primary steering pump was lost or if engine failure occurred. The supplemental pump operated according to the position of the manual/automatic switch on the dashboard panel.

The switch activated the supplemental pump and supplemental steering indicator light on the dashboard panel. During normal operation, the manual/automatic switch was to be placed in the AUTO position according to the Caterpillar Service Manual. In this position, if the engine stopped while there was movement of the machine, a flow switch would automatically activate an electronic control module that activated the supplemental battery-powered supplemental steering pump. The Caterpillar Service Manual stated that the manual/automatic switch was to be placed in the manual position only when the machine was towed.

7) STEERING SYSTEM INSPECTION AND TESTING: After the engine was made operational, the truck was maneuvered through a number of left and right turns and no steering deficiencies were found.

The supplemental steering system also operated in conformance with another test procedure described in the Caterpillar Service Manual. When the key was placed in the "ON" position, the supplemental steering indicator light was activated, the battery powered supplemental steering pump was activated for three seconds, and the front wheels could be turned with normal steering effort during the three second period of time without the engine running. The supplemental steering system also functioned when the manual/automatic button was placed in the MANUAL position.

8) THROTTLE PEDAL INSPECTION AND TESTING AND FUEL GAGE LEVEL: Prior to starting the truck, the throttle pedal was manually operated and the throttle position sensor output was monitored with the Caterpillar Electronic Technician diagnostic/service tool. The output varied from zero to 100 percent then back to zero as the throttle pedal was moved. The output varied smoothly and in proportion to the amount of pedal travel. After the engine was started, the truck was operated and no throttle defects were found.

The fuel gage needle retained the reading that existed when the engine was shut down. After the truck was recovered, the fuel gage indicated over half a tank of fuel.

9) BRAKE SYSTEMS AND RETARDER SYSTEM OVERVIEW: The truck was equipped with a service brake, a secondary brake, a parking brake, and a retarder.

10) SERVICE BRAKE SYSTEM DESIGN: The service brakes consisted of air-over-oil actuated, dry-caliper disc type brakes at the front wheels, and oil-cooled, air-over-oil actuated, wet multi-disc brakes in the rear. The front and rear service brakes were controlled by a foot operated pedal. An "ON-OFF" switch on the dashboard panel allowed the operator to enable or disable the front service brakes.

11) SECONDARY BRAKE SYSTEM DESIGN: The truck was equipped with a spring-return hand operated control on the left side of the steering column to provide modulated secondary braking. The secondary brake could be used to stop the truck if there was any single failure in the service brake system. The secondary brake modulated air pressure to apply the front service brakes and it modulated hydraulic pressure within the parking brake system to allow springs to apply the same rear axle multi-wet disc brakes as used for the service brakes.

12) PARKING BRAKE DESIGN: The truck was equipped with an "ON-OFF" hand control for the parking brake located on the transmission control console. The parking brake system used the same rear wet multi-disc brakes utilized by the service brakes. However, the multi-disc brakes were spring applied and hydraulically released when they functioned as the parking brakes. The engine had to be operating to allow the Parking and Secondary Brake Release Pump Section to develop the hydraulic pressure needed to release the spring-applied parking brakes.

13) RETARDER SYSTEM DESIGN: The truck was equipped with a hand control lever on the right side of the steering column to provide vehicle retarding. The retarder control gradually provided air pressure to proportionally apply (modulate) only the rear service brakes.

14) SERVICE BRAKE SYSTEM INSPECTION AND TESTING: After the truck was recovered, the front service brake switch was found in the ON (enabled) position. The

service brake pedal moved freely throughout its range of motion and returned to its normal position when foot pressure was released.

After the engine was made operational, the service brake test described in the Caterpillar Service Manual was also performed. The service brake test consisted of placing the transmission into second gear, with the engine at 1,200 rpm and attempting to drive through the fully applied service brake. The machine did not move when this test was conducted, indicating acceptable performance. An additional test showed the service brake had the ability to hold the empty truck on a 15% test slope. No service brake deficiencies were found as the truck was operated and numerous stops were made.

15) SECONDARY BRAKE SYSTEM INSPECTION AND TESTING: The secondary brake control handle was found in the released position when the truck was recovered. It moved freely and returned to the "OFF" position when released.

After the engine was made operational, the secondary brake test described in the Caterpillar Service Manual was also done. The transmission was placed in a forward gear and the engine speed was increased to 1,200 rpm. The machine did not move when this test was done, indicating acceptable performance. An additional test showed that the secondary brake had the ability to hold the empty truck on a 15% test slope.

16) PARKING BRAKE INSPECTION AND TESTING: After the truck was recovered, the parking brake switch was found in the "OFF" position. It moved freely and there was no visible damage.

Prior to starting the engine, a pushing force was applied to the truck using a wheel loader. The engine must be running to allow the Parking and Secondary Brake Release Pump Section to develop the hydraulic pressure needed to release the spring-applied parking brakes. The rear wheels of the empty truck slid when it was pushed forward indicating the spring-applied parking brake was functioning. The parking brake system used the same rear wet multi-disc brakes as used for the service brakes.

The Caterpillar Service Manual specified a hold-on-grade test for the parking brake. The manual notes that the test should be done on no more than a 15% grade with the truck loaded to the normal rated capacity. Due to the compromised condition of the dump body hoist system, this field test was performed with the truck empty on a 15% grade; and the truck held on this grade.

17) RETARDER INSPECTION AND TESTING: The retarder control handle was found in the RELEASED position after the truck was recovered and moved freely. The Caterpillar Service Manual also specified a hold-on-grade test for the retarder and did

not specify a loaded or empty truck condition. The truck was tested empty and the retarder held it on a 15% grade.

18) SEAT BELT: Sand and small rocks from the latching mechanism, that had been submerged as a result of the accident, were cleaned. When tested, the seat belt latched and unlatched

#### SUMMARY:

The steering system, throttle system, braking systems, retarder and headlights were inspected and tested and no defects were found. The seat belt latched and unlatched when tested.

### TOXICOLOGY

The results of the victim's postmortem toxicology screening indicated cyclobenzaprine (.063mg/L), doxylamine (0.13 mg/L), nortriptyline (0.09 mg/L), and ethyl alcohol (0.048).

### TRAINING AND EXPERIENCE

Carl J. Clinton, victim, had 27 years mining experience. He worked 4 years and 37 days at this mine. Clinton was a lead man for 1 year 2 days and had worked for 3 years 35 days as an equipment operator while at this mine. A representative of MSHA's Educational Field Services staff conducted an in-depth review of the mine operator's training records and determined Clinton's training was up to date in accordance with 30 CFR Part 46.

### ROOT CAUSE ANALYSIS

The investigators conducted a root cause analysis and the following root cause was identified:

**Root Cause:** Management failed to ensure that persons could safely operate mobile equipment. The victim was drowsy and was found sleeping during his shift; however, he continued to operate mobile equipment.

**Corrective Action:** Management established rules and responsibilities regarding any employee suspected of being impaired while on the job. The rules were explained to all of the employees at the mine.

## CONCLUSION

The accident occurred due to management's failure to ensure that persons could safely operate mobile equipment. Investigators learned through interviews that Clinton was drowsy and was found sleeping during his shift; however, he continued to operate mobile equipment. The combination of alcohol and drugs found in the toxicology screening could account for the observed drowsiness displayed by the victim. Clinton was not wearing a seat belt.

## ENFORCEMENT ACTIONS

### Issued to Vulcan Construction Materials, L. P.

Order Number - 8641313 issued on November 7, 2013, under the provisions of Section 103 (j) of the Mine Act:

*An accident occurred at this operation on 11/07/2013 at approximately 22:15 EST. As rescue and recovery work is necessary, this order is being issued, under Section 103(j) of the Federal Mine Safety and Health Act of 1977, to assure the safety of all persons at this operation. This order is also being issued to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity at the area between crusher pile and 57 stock pile and pond until MSHA has determined that it is safe to resume normal mining operations in this area. This order applies to all persons engaged in the rescue and recovery operation and any other persons on-site. This order was initially issued orally to the mine operator at 22:50 and has now been reduced to writing.*

Citation Number - 8641314 issued under the provisions of Section 104(a) of the Mine Act for a violation of 56.9101:

*A fatal accident occurred at this operation on November 7, 2013, when a haul truck left the haul road, traveled through the berm, and rolled on to its side in a water filled settling pond. The driver of the haul truck did not maintain control of the truck while it was in motion. The cab of the haul truck was completely submerged and the driver died due to drowning.*

Citation Number- 8641315 issued under the provisions of Section 104(a) of the Mine Act for a violation of: 56.14131(a):

*A fatal accident occurred at this operation on November 7, 2013, when a haul truck left the haul road, traveled through the berm, and rolled on to its side in a water filled settling*

pond. The driver was not wearing a seat belt provided in the truck. The cab of the haul truck was completely submerged and the driver died due to drowning.

Approved:  Date: 3/31/14  
Samuel K. Pierce  
District Manager

## APPENDIX A

### Persons Participating in the Investigation

#### Vulcan Construction Materials, L.P.

Steve Collier	General Superintendent
Melanie Wood	Manager, Safety & Health
Wayne Hemmerich	Safety & Health Manager
Robby Norton	Front-end Loader Operator
Charles Havlik	Maintenance Repairman
Ray Coulter	Leadman
Henry Kirby	Equipment Operator
Joseph Poole	Night Shift Pit Foreman

#### Douglas County Sheriff's Office

Matt Gray	Investigator
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#### Douglas County Coroner's Office

Nathan Mitchell	Douglas County Chief Deputy Coroner
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#### Douglas County Fire Department

John Crews	Captain
Dwayne Bennett	Lieutenant/Paramedic
Howard Shadix	Lieutenant/EMT-1
Richard Glowacki	Fire Fighter/EMT-1
Robert Aslinger	Fire Fighter -111

#### Mine Safety and Health Administration

Billy Randolph	Supervisory Mine Safety and Health Inspector
Michael Evans	Southeastern District Safety Specialist
Ronald Medina	Mechanical Engineer
Norberto Ortiz	Mine Safety and Health Specialist (Training)

## APPENDIX B

**Accident Investigation Data - Victim Information**

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



Event Number: 

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Victim Information: **1**

1. Name of Injured/ill Employee: <i>Carl J. Clinton</i>	2. Sex: <i>M</i>	3. Victim's Age: <i>46</i>	4. Degree of Injury: <i>01 Fatal</i>
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5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 11/07/2013 b. Time: 23:09</i>	6. Date and Time Started: <i>a. Date: 11/07/2013 b. Time: 22:15</i>
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7. Regular Job Title: <i>176 Haul Truck Operator</i>	8. Work Activity when Injured: <i>055 Hauling crushed rock to stock pile</i>	9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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10. Experience			b. Regular			c. This			d. Total		
Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days
a. This			Job Title:			Mine:			Mining:		
3	4	6	3	4	6	4	0	0	27	0	0

11. What Directly Inflicted Injury or Illness? <i>014 water filled settling pond</i>	12. Nature of Injury or Illness: <i>110 Drowning</i>
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13. Training Deficiencies			
Hazard:	New/Newly-Employed	Experienced Miner:	Task:

14. Company of Employment: (if different from production operator) <i>Operator</i>	Independent Contractor ID: (if applicable)
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15. On-site Emergency Medical Treatment					
Not Applicable:	<input checked="" type="checkbox"/>	First-Aid:	CPR:	EMT:	Medical Professional:
					None:

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