

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

REPORT OF INVESTIGATION

**Surface Metal Mine
(Gold)**

**Fatal Powered Haulage Accident
October 31, 2017**

**Marigold Mining Co.
Marigold Mine
Valmy, Humboldt County, Nevada
Mine ID No. 26-02081**

Investigators

**James Fitch Jr.
Mine Health and Safety Specialist**

**Joel Dozier
Mine Safety & Health Inspector**

**Ronald Medina
Mechanical Engineer**

**Originating Office
Mine Safety and Health Administration
Western District
991 Nut Tree Road
Vacaville, CA 95687
Peter J. Montali, Acting District Manager**

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OVERVIEW

Pete Kuhn, a 60-year old Safety Superintendent, and Omar Bernal, a 39-year old Truck Driver, were killed on October 31, 2017, when a loaded 340-ton haul truck ran over their van.

The accident occurred because management did not ensure miners followed policies, procedures and controls on communicating with heavy mobile equipment in a congested area. The van driver did not communicate with the haul truck driver when he parked the van adjacent to the haul truck. Traffic rules were not effective to ensure heavy mobile equipment was aware of all traffic in a congested area.

GENERAL INFORMATION

Marigold Mining Co. owns and operates the Marigold Mine, a multiple bench, open pit and heap leach, surface gold operation. It is located near Valmy, Humboldt County, Nevada. Duane Peck, General Manager, is the principal official. The mine operates seven days per week with two, twelve-hour shifts per day. Total employment is 380 persons.

Marigold Mine drills and blasts rock in the open pits and uses hydraulic-electric shovels and front-end loaders to load gold-bearing ore in large haul trucks. The haul trucks deliver the ore from the pit to pads for the leaching process. Marigold Mine sends the leachate (the material gathered during the leaching process) through a carbon absorption facility and then to the processing plant where the gold is smelted into dorè bars. The dorè bars are shipped to a refinery in Utah and the gold is sold on the open market.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on July 7, 2017.

DESCRIPTION OF THE ACCIDENT

On October 31, 2017, Pete Kuhn (victim) arrived at the Marigold Mine at 4:40 a.m. Kuhn met Ryan Ispisua, Senior Safety Coordinator, and they began the day by inspecting the rescue truck. Kuhn and Ispisua went from there to perform a pit inspection and returned to the office around 7:30 a.m. Kuhn attended a safety department meeting with Ispisua, Mark Langston, Safety Manager, and Shane Anderson, Senior Safety Coordinator, from 10:30 a.m. to 12:30 p.m.

Omar Bernal (victim) arrived at the Marigold Mine at approximately 5:30 a.m. and went to the site access building. Although Bernal had worked at the mine before as a temporary employee, this was his first day as a Marigold employee. Seven additional new employees joined Bernal and were escorted from security to the safety training room around 6:00 a.m. to begin in-processing. Kuhn checked in on the group's progress periodically through the morning. Kuhn returned to the HR room around 12:30 p.m. after his safety meeting, but found the group had not completed all of their paperwork. Kuhn took a lunch break then went to the warehouse to gather Personal Protective Equipment (PPE) for the new employees, in preparation for a tour of the mine.

Kuhn returned to the HR room, handed out the PPE and then he and the eight new employees got into van #1176 to begin an introductory mine tour. Around 1:40 p.m., witnesses observed the van travel around the process area and continue toward the Section 20 shops and yard.

At 1:12 p.m., haul truck #475 descended the Section 20 ramp and started to slide. The driver was able to stop the truck using the service brakes and the berm on the left side of the road, and came to rest about 300 feet uphill from the Section 20 ramp, and the lower Section 29/M5 intersection (hereafter referred to as "the intersection"). Under company

policy, when a driver uses the service brake at a speed over five miles per hour, the truck is secured in place until mechanics check to make sure the service brakes have not been damaged. The haul truck was traveling over five miles per hour when the driver had to apply the service brakes, so the driver could not move the truck until a mechanic could examine the brakes. As a result, the dispatcher suspended traffic on the Section 20-ramp and Larry Dowd, Shifter, went to the area to manage the scene. When Dowd arrived, he found the haul truck partially blocked the road. He set up road blocks using mobile equipment - one roadblock just above the spun-out truck, and one near the intersection just below the spun-out truck. Dowd also helped the dispatcher reroute traffic and clear the pit in preparation for the blast scheduled for 2:00 p.m., while he continued to monitor the haul truck.

Coty Munson, Haul Truck Operator 1, was operating haul truck #481, hauling rock from the pit up to the cell 21 leach pad when the call to suspend traffic went out. Munson stopped his truck on the 29-ramp, approximately 0.4 miles downhill from the intersection. During his interview, Munson recalled Dowd calling over the radio telling him to take his load back down to the bottom of the pit. Munson turned the truck around and began to return to the Mackay 2 pit. At 1:46 p.m., Munson called dispatch and asked for permission to go to the cell 21 leach pad since they were clearing the pit to blast and he did not want to take his load all the way to the pit to dump. Dispatch called him back and gave him permission to go to cell 21 leach pad once the road was re-opened. Munson continued to wait for the spun-out truck to be cleared.

Around 1:50 p.m., Kuhn began to drive the van from Section 20 toward the pit. The van was allowed to pass through the first roadblock set up on 20-ramp and proceeded downhill toward the spun-out haul truck and the pit. Kuhn stopped and talked briefly to Dowd, asked if everything was okay and requested permission to go into the pit so the new employees could observe the 2:00 p.m. blast. Dowd told Kuhn they could go ahead and mentioned the area was congested. Dowd called the roadblock at the intersection on the radio at 1:56 p.m. and said "a white van is coming through your area, please let them through." Kuhn drove around the spun-out haul truck, and then passed through the roadblock at the intersection of the 20-ramp and the 29-ramp. Audio recordings of radio transmissions did not contain any radio calls from the van as it approached the haul truck. The mine operator has a policy that states that all small vehicle operators must make radio contact when approaching or passing large surface mining equipment. Kuhn parked the van facing roughly south, on the right side of the haul truck. While the van was parked, the group inside was talking. Taylor Kesterson, one of the new employees, got out of the van to see if she could get a better view of the blast but returned to the van because she could not see over the berm.

Sometime between 1:57 p.m. and 2:04 p.m., Mark Kirklie, Lead Driller, and four passengers traveled in another van up from the pit set up a roadblock for the blast, about 100 yards, from Munson's truck (haul truck #481). According to Kirklie, both haul truck #481 and van #1176 were parked when he set the roadblock. In his statement, Kirklie said the van was parked to the right of and slightly ahead of the haul truck.

Kirklie and the four other passengers in van #1119 were able to see both van #1176 and truck #481.

Munson watched from the cab of his truck as Kirklie set up the roadblock, approximately 100 yards in front of him. Dowd called on the radio to let the dispatcher know the road was reopened and at 2:05 p.m., the dispatcher alerted miners that haul truck #475 was cleared from the road and 29-ramp was open. Munson looked at the screen on the radio to verify the call had come from the dispatcher and since he had received permission earlier to take his load to the cell 21 leach pad, Munson decided to start moving the truck. He said he looked in his mirrors and did not see the van. Earlier, he saw a white van pass by him but did not hear anything over the radio about any other equipment near his truck. Munson honked his horn twice, put the truck into forward gear, released his brake and began to turn sharply to the right to make the U-turn to go back uphill to the cell 21 leach pad. He applied the throttle and felt hesitation. Munson heard “481 stop, stop, stop” over the radio and immediately stopped the truck.

According to interviews, the occupants inside of van #1176 saw the truck begin to move and turn toward them. Kuhn yelled at the group to get out. Interviewees stated Kuhn was reaching towards the dash, trying to possibly move the vehicle or perhaps call over the radio to stop haul truck #481. Jacob Jakich, who was sitting on the bench seat behind Kuhn, was the first person out of the van. He reported miners inside the van were having trouble opening the double doors on the passenger side of the van. Bernal was sitting in the front passenger seat of the van. Jakich climbed over Bernal to get out of the front passenger door. Jakich opened the side doors from the outside then ran around the front of the van to try and get the driver’s (haul truck #481) attention but, was unable to do so. The passengers in the rear of the van were able to help each other get out through the side doors, or through a side window. Bernal and Kuhn did not escape before the truck ran over the front of the van.

Three individuals in van #1119, including Kirklie, heard truck #481 honk its horn and saw it begin to turn. Kirklie yelled over the radio “481, 481 stop, 481 stop!” but was too late. Kirklie then called “Mayday” over the radio and ran uphill to the accident scene to help. When he arrived, he saw that the passengers who were able to get out of the van were not seriously hurt. He checked the front passenger side of van #1176 and saw one person was crushed. He quickly went to the driver’s side under the truck and found another person also was crushed.

Dowd arrived at the accident scene and took control. First responders arrived and began to treat the passengers outside of the van. Alan Sturtz, a passenger in the van, received a leg injury. Other than the victims, he was the only other person physically injured in the accident. Sturtz was transported to the hospital in Winnemucca, Nevada, for treatment. The other six passengers of the van and the haul truck driver, Munson, were taken to medical facilities in Battle Mountain and Winnemucca, Nevada and were evaluated and treated for shock.

The Humboldt County Sheriff's Office, Nevada Highway Patrol, Fire Departments from Valmy and Winnemucca and Emergency Medical Services responded to the site. The operator developed a plan to safely move the haul truck to recover the victims. Detective Victor Castaneda, Coroner, pronounced Omar Bernal dead at 12:20 a.m. and Pete Kuhn dead at 12:45 a.m. on November 1, 2017.

INVESTIGATION OF THE ACCIDENT

Kathy Hewett, Health and Safety Assistant, called the Department of Labor National Contact Center (DOLNCC) at 2:51 p.m. on October 31, 2017, to notify MSHA of the accident. The DOLNCC contacted Joshua Love, MSHA Western District Safety Specialist. MSHA issued an order under provisions of Section 103(k) of the Mine Act to ensure the safety of the miners and began the investigation.

MSHA's accident investigation team conducted a physical inspection of the accident scene, interviewed employees, reviewed training documentation, and examined work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, and contractor management personnel.

DISCUSSION

Location of the Accident

The accident occurred on the 29-ramp, which is a section of the road between the Mackay 2 pit and Section 20 facility. Both van #1176 and haul truck #481 were parked on a 6% downhill grade, facing southwest, toward the pit. The roadway was dry, hard packed earth and appeared well maintained.

Equipment involved in the accident

Van #1176

The victims were in a 2012, Ford E-350 passenger van with the assigned company number of 1176. The seating consisted of bucket seats for the driver and front passenger and 4 bench seats in the back for additional passengers. The van was destroyed, so the operation of the van controls, engine, brakes and transmission could not be tested. The Nevada Highway Patrol came to the site to determine if information could be retrieved from the computer for the van, but it was too badly damaged. The investigators examined the front passenger seat belt buckle assembly and found it to be damaged. The investigators determined the damage could have been as a result of the accident and, even though it was damaged, it was still operable.

Haul Truck Company #481 - 2009 Hitachi rigid dump truck, Model Number EH5000ACII

The haul truck involved in the accident was a Hitachi, Model EH5000ACII, dump truck. Electric wheel motors propel the haul truck, one at each rear wheel and the speed of the truck was controlled with a throttle pedal. The diagnostic electronic history data downloaded from the truck did not indicate any active brake, retarder, steering, or throttle faults the day of the accident.

The maximum gross machine weight rating was 528,208 kg (582.25 tons) and the empty weight was 218,915 kg (241.3 tons.) Payload electronic data indicated it was carrying a load of 342.8 tons at the time of the accident and was loaded at 12:50:43 on October 31, 2017.

The right front tire of the Hitachi haul truck struck the passenger van. The accident did not otherwise affect the haul truck.

According to witness accounts, the passenger van stopped along-side the Hitachi truck about 20 feet away. Investigators concluded the van was slightly farther down the haul road than the haul truck since the front of the van was in the turning radius path of the front right tire. Investigators were not able to determine the precise location where the van stopped relative to the truck.

MSHA investigators mapped out the area the operator could directly see in front of and on the right side of the truck. A flag, 85 inches high (the same height as the Ford E-350 passenger van), was used to determine the haul truck operator's line-of-sight. Data was collected by moving the flag from point to point on a 10' by 10' grid pattern laid out on the ground. The grid map showed the van was not visible to a person seated in the operator's seat of the Hitachi truck anywhere in the area where it stopped. In a separate test, investigators positioned a similar Ford E-350 van at several locations in the simulation area and the van was not directly visible to a person seated in the operator's seat of the Hitachi truck.

The truck was equipped with four cameras: 1) front view, 2) front right corner view, 3) right side view, and 4) rear view. The camera images were displayed on a quad split screen, 12-inch monitor in the operator's compartment. Each image took ¼ of the screen. Investigators mapped the coverage area of each camera in the simulation area using the 85 inch high flag and 10-foot grid and by parking a similar van at several locations in the area where the van stopped relative to the haul truck. This testing showed at the time of the accident the van was not visible in three of the camera video images, but may have been partly visible in the video image for the front camera. The van may have been visible in the periphery of the wide-angle video image upon close scrutiny of the quad-screen video monitor. This could not be definitively determined due to the uncertainty regarding the exact van location relative to the truck at the time of the accident. The camera images on the monitor lacked clarity especially in the peripheral areas of each of the four screens. The investigators concluded even if the van or flag were visible in the periphery of one of four camera images, it would be unrealistic to expect a person getting information from so many sources - direct line of sight, two mirrors, and four camera images, to be able to detect subtle images in the periphery of one of the cameras.

Weather

The weather was clear, near 50 degrees, with a slight breeze. At the time of the accident, the sun had started to set, but according to Munson, was not causing visual difficulty. Weather is not considered to be a contributing factor in the accident.

Training and Experience

Pete Kuhn had one year, eight weeks of experience as Safety Superintendent at this mine and over 25 years in the mining industry. Omar Bernal had sixteen weeks of experience as a Haul Truck Operator 1 as a temporary employee at this mine. This was his first day as a Marigold employee. A representative of MSHA's Educational Field and Small Mine Services staff conducted an in-depth review of the mine operator's training records including the training records for Kuhn and Bernal. The company was unable to provide an Experienced Miner training record for Kuhn, but his training was found to be in compliance with MSHA training requirements. MSHA issued the operator a citation for the missing training record under a different event number. Omar Bernal's training records were found to be compliant.

ROOT CAUSE ANALYSIS

Investigators conducted a root cause analysis and identified the following root cause:

Root Cause: The mine operator did not ensure that mobile equipment operators followed existing rules on making positive contact with each other. The van operator did not make radio contact and visual contact with the operator of mobile equipment. In addition, the van operator parked in the blind spot of the 340 ton haul truck.

Corrective Action: The Company updated policies and procedures and developed new training materials, adding information concerning blind spot awareness and communication. Using the updated policies and procedures and new training material, the operator retrained the workforce.

CONCLUSION

Pete Kuhn and Omar Bernal were killed when a loaded 340-ton haul truck ran over the passenger van they occupied. The accident occurred because management did not ensure miners followed policies, procedures and controls on communicating with heavy mobile equipment in a congested area. The van driver did not communicate with the haul truck driver when he parked the van adjacent to the haul truck. Traffic rules were not followed to ensure heavy mobile equipment was aware of all traffic in a congested area.

ENFORCEMENT ACTIONS

Issued to Marigold Mining

Order No. 8999536 - Issued under the provisions of section 103(j) of the Mine Act. An Authorized Representative modified this order to section 103(k) of the Mine Act upon arrival at the mine site:

An accident occurred at this operation on 10/31/2017 at approximately 15:01. 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 Section 20, 29 ramp until MSHA has determined that it is safe to resume normal operations in this area. This order was initially issued orally to the mine operator at 15:30 and has now been reduced to writing.

This order was terminated after conditions that contributed to the accident no longer existed.

104(a) Citation No. 6370243 was issued for a violation of 30 CFR 56.9100(a):

On October 31, 2017, Haul Truck No 481 ran over a passenger van that was parked too close to No. 481. No. 481 was parked in idle on Section 29 ramp, which was closed to traffic. The passenger van, carrying 9 miners, pulled up and parked to the right of No. 481. When the ramp reopened and No. 481 was given clearance to move, it turned right and ran over the passenger compartment of the van, resulting in two fatalities. The company had established traffic rules, but failed to ensure that they were followed as they allowed the passenger van to enter into the area beyond a barricade, into a congested area, and to park in the truck's blind spot.

Approved: _____

Date: _____

Peter J. Montali
Acting District Manager

**Appendix A : Persons Participating in the Investigation
(Persons interviewed are indicated by a * next to their name)**

Marigold Mining Co., Marigold Mine:

Duane Peck, Mine General Manager
Mark Langston*, Safety Manager
Ginger Peppard, Environmental Manager
Ryan Ispisua, Senior Safety Coordinator
Shane Anderson, Senior Safety Coordinator
Greg Gibson, Operations Manager
Rigoberto Villanueva, Representative of Miners
Rick Frost, Representative of Miners
James Browning, Haul Truck Driver/Representative of Miners
Cascade Smith, Maintenance Superintendent
Rodney Sample, Shop Supervisor
Alvin Paine, Electrician
Mark Kirklie, Lead Driller
Coty Munson*, Haul Truck Operator 1
Jacob Jakich*, Haul Truck Operator 1
Matthew Wendell*, Maintenance Mechanic
Corbin Goldsmith*, Mine Engineer
Doug Longchamps*, Assay Lab Technician
Felipe Jeronimo-Hernandez*, Haul Truck Operator 1
Larry Dowd*, Shifter (Foreman)
Syd Hawkins*, Dispatcher
Mike Price*, Haul Truck Operator 1
Bill Gleixner*, Haul Truck Operator 1
Nathan Odle*, Senior Training Supervisor

Holland & Hart:

Joe M. Teig, Attorney
Trey Overdyke, Attorney
Frank Z. LaForge, Attorney

MSHA:

James Fitch Jr., Mine Health and Safety Specialist, Western District Office
Patrick Barney, Inspector, Elko, NV Field Office
Joel Dozier, Inspector, Boise, ID Field Office
Gary Hebel, Supervisory Inspector, Elko, NV Field Office
Charles Snare, Inspector, Elko, NV Field Office
Ronald Medina, Engineer, MSHA Technical Support
Joseph Rhoades, Mine Safety and Health Specialist (Training)

Nevada Mine Safety and Training Section:

Jim Peterson, Mine Inspector

Humboldt County Sherriff's Office:

Detective Victor Castaneda, Coroner

H2O Environmental

Kevin Anderson, Operations Manager

Appendix B

Accident Investigation Data - Victim Information

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



Event Number:

Victim Information: 1																															
1. Name of Injured/Ill Employee: <i>Pete Kuhn</i>				2. Sex <i>M</i>		3. Victim's Age <i>60</i>			4. Degree of Injury: <i>01 Fatal</i>																						
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 11/01/2017 b. Time: 0:45</i>								6. Date and Time Started: <i>a. Date: 10/31/2017 b. Time: 4:40</i>																							
7. Regular Job Title: <i>149 Safety Superintendent</i>						8. Work Activity when Injured: <i>072 Driving Passenger Van</i>						9. Was this work activity part of regular job? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																			
10. Experience		Years		Weeks		Days		b. Regular		Years		Weeks		Days		c. This		Years		Weeks		Days		d. Total		Years		Weeks		Days	
Work Activity:		<i>1</i>		<i>8</i>		<i>0</i>		Job Title:		<i>1</i>		<i>8</i>		<i>0</i>		Mine:		<i>1</i>		<i>8</i>		<i>0</i>		Mining:		<i>25</i>		<i>20</i>		<i>0</i>	
11. What Directly Inflicted Injury or Illness? <i>076 340 Ton Haul Truck</i>									12. Nature of Injury or Illness: <i>170 Crushina</i>																						
13. Training Deficiencies:																															
Hazard:				New/Newly-Employed Experienced Miner:				Annual:				Task:																			
14. Company of Employment: (If different from production operator) <i>Operator</i>												Independent Contractor ID: (if applicable)																			
15. On-site Emergency Medical Treatment:																															
Not Applicable:				First-Aid:				CPR:				EMT:				Medical Professional:				None: <input checked="" type="checkbox"/>											
16. Part 50 Document Control Number: (form 7000-1)										17. Union Affiliation of Victim: <i>9999</i>						<i>None (No Union Affiliation)</i>															

Appendix C

Victim Information: 2																				
1. Name of Injured/Ill Employee: <i>Omar Bernal</i>			2. Sex <i>M</i>	3. Victim's Age <i>39</i>			4. Degree of Injury: <i>01 Fatal</i>													
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 11/01/2017 b. Time: 0:20</i>										6. Date and Time Started: <i>a. Date: 10/31/2017 b. Time: 6:00</i>										
7. Regular Job Title: <i>176 Haul Truck Operator 1</i>					8. Work Activity when Injured: <i>042 Observing Operations</i>					9. Was this work activity part of regular job? <table style="width: 100%; border: none;"> <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"/>																	
10. Experience:																				
a. This			b. Regular			c. This			d. Total											
Years	Weeks	Days	Years	Weeks	Days	Years	Week	Days	Years	Weeks	Days	Years	Weeks	Days						
Work Activity: <i>0</i>	<i>16</i>	<i>0</i>	Job Title: <i>0</i>	<i>16</i>	<i>0</i>	Mine: <i>0</i>	<i>16</i>	<i>0</i>	Mining: <i>0</i>	<i>16</i>	<i>0</i>	<i>0</i>	<i>16</i>	<i>0</i>						
11. What Directly Inflicted Injury or Illness? <i>076 340 Ton Haul Truck</i>								12. Nature of Injury or Illness: <i>170 Crushing</i>												
13. Training Deficiencies:																				
Hazard:		New/Newly-Employed			Experienced Miner:			Annual:		Task:										
14. Company of Employment: (If different from production operator) <i>Operator</i>										Independent Contractor ID: (if applicable)										
15. On-site Emergency Medical Treatment:																				
Not Applicable:		First-Aid:		CPR:		EMT:		Medical Professional:			None:		<input checked="" type="checkbox"/>							
16. Part 50 Document Control Number: (form 7000-1)										17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>										

Appendix D

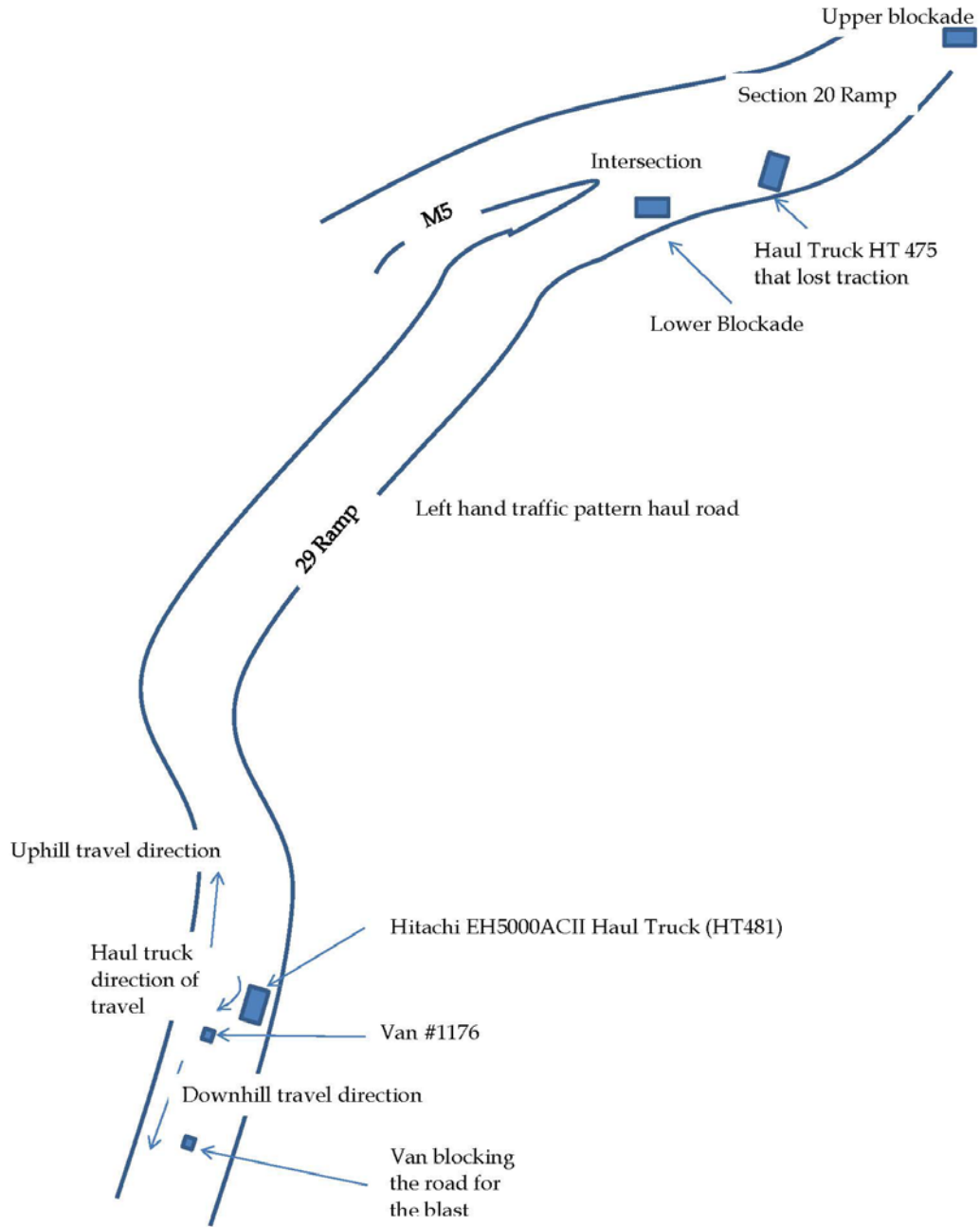


Figure 1: Overview of accident area (not to scale)