

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

REPORT OF INVESTIGATION
Surface Nonmetal Mine
(Construction Sand and Gravel)

Fatal Falling/Sliding Material Accident
February 28, 2014

East Coast Mines Ltd.
East Coast Mines Ltd.
East Quogue, Suffolk County, New York
MSHA I.D. No. 30-00865

Investigators

Thomas J. Shilling
Mine Safety & Health Inspector

James B. Pfeifer
Civil Engineer

Megan N. Lavage
Civil Engineer

Gregory J. Mehalchick
Mine Safety & Health Specialist (Training)

Originating Office

Mine Safety and Health Administration
Northeast District
Thorn Hill Industrial Park
178 Thorn Hill Road, Suite 100
Warrendale, Pennsylvania 15086-7573
Donald J. Foster, Jr. Northeast District Manager



OVERVIEW

On February 28, 2014, Declan J. Boland, Supervisor/Safety Director, age 50, was killed at this mine. Boland went to the mine's reclamation dump site to investigate a report of smoke sighted at that area. He traveled to the site with another miner, parked his truck, and started to climb an embankment. When Boland climbed approximately 40 feet, the embankment failed and engulfed him.

The accident occurred due to the management's failure to establish methods to maintain the slope stability at the reclamation dump site where miners worked or traveled in performing their assigned tasks. The material being used to reclaim the area was a mixture of approximately 70 percent loam and 30 percent mulch. The moisture content, the frozen condition, and the fibrous nature of the loam/mulch mixture could have allowed the material to hold itself in a slightly over-steepened state. The material dumped on the day of the accident added an additional load and could have created a slope that was marginally stable. The relatively warm material (woody mulch) could have thawed the frozen mulch already in place. A combination of these factors caused a temporary reduction of shear strength within the reclamation material causing the marginally stable slope to fail.

GENERAL INFORMATION

East Coast Mines Ltd., an open pit sand and gravel mine owned and operated by East Coast Mines Ltd., is located near East Quogue, Suffolk County, New York. The principal operating official is John B. Tintle, President. The mine operates one 8-hour shift per day, five days a week. Total employment is nine persons.

Sand and gravel is mined using a front-end loader. The material is transported to one stationary and several portable screening plants via front-end loader and haul trucks. The material is screened, sized, and sold for construction and landscaping. The mine also has an onsite mulching plant that makes mulch from trees hauled in from other sites. The mulch is sold for landscaping material.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection of this operation on November 5, 2013.

DESCRIPTION OF ACCIDENT

On the day of the accident, Declan J. Boland (victim), Supervisor/Safety Director, arrived for work at 7:00 a.m., his normal start time. Boland made his normal rounds and assigned tasks as necessary to eight miners. About the same time, Michael B. Partridge, Front-end Loader Operator, traveled to the top of the reclamation dump site and used the front-end loader to push several truckloads of material over the edge of an embankment. Partridge returned to the pit area to screen sand for the remainder of the morning.

About 12:00 p.m., Brian W. Downs, Front-end Loader Operator, traveled to the top of the reclamation dump site to push off material while the other miners ate lunch. During that time, John B. Tintle, President, and Boland ate lunch in Boland's office trailer. At approximately 12:30 p.m., Downs called Tintle over the radio to report "smoke" rising from the embankment. After observing the reclamation area from his office trailer window, Tintle decided this was not unusual and directed Downs to ignore the smoke.

After lunch, Boland and Eduardo Arias, Mechanic, went to look for a belt conveyor tail roller they needed at the plant. As they traveled, Boland decided to check out the smoke Downs had reported. Boland drove his truck along the bottom road on the northwest side of the pit. He stopped near the toe of the approximately 80-foot high embankment and parked the truck. Both Boland and Arias exited the truck. Arias grabbed a shovel from the bed of the truck. Boland took it explaining to Arias this was his job.

As Boland began walking up the embankment toward the reported smoke, Arias followed close behind. After taking a few steps, Boland instructed Arias to stop. Boland continued up the slope of the embankment. When Boland climbed about 40 feet up the slope, material began to slide and he yelled for Arias to run. As Arias ran away from the sliding material, he turned and saw Boland running and jumping down the slope. When Arias reached the bottom, he turned and saw Boland covered up to his waist and within seconds fully engulfed.

Arias ran to the spot where Boland was covered and started digging. When Arias heard a front-end loader nearby, he stopped and frantically waved his arms to Downs. Downs, who was feeding the screening plant, also witnessed the slide and saw Boland running down the slope, but he was unaware the slide had engulfed Boland. When Downs saw Arias waving for help, he immediately called on his radio for emergency assistance. At approximately 1:10 p.m., Tintle heard Downs' radio message and instructed Lisa Lamitie, Weigh Master, to call 9-1-1.

Tintle rushed to the reclamation dump site. When he arrived, several crew members were digging into the embankment trying to uncover Boland. After about 15 minutes, Tintle realized the rescue efforts were futile and signaled for a front-end loader. Aidan F. Boland, Front-end Loader Operator (victim's brother), arrived and used the front-end loader to remove material from the area. After four or five bucket loads were removed, Boland was located.

At 1:23 p.m., Emergency Medical Services (EMS) arrived and EMS personnel helped dig around Boland to free him from the material. Boland was placed on a backboard and attempts were made to revive him using an Automated External Defibrillator (AED). Boland was transported to the Peconic Bay Medical Center where he was pronounced dead by the Suffolk County Medical Examiner at 2:11 p.m. The victim's death was attributed to mechanical asphyxia and blunt force trauma.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident on February 28, 2014, at 2:01 p.m. by a telephone call to the National Call Center from John B. Tintle, President. The National Call Center notified Dennis A. Yesko, Assistant District Manager, and an investigation was started the same day. An order was issued pursuant to Section 103(j) of the Mine Act. This order was later modified to Section 103(k) of the Mine Act after the arrival of an Authorized Representative at the mine site.

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 representatives from the Southampton Town Police Department and the Occupational Safety and Health Administration (OSHA).

DISCUSSION

Location of the Accident

At the time of the accident, the northwest corner of the open pit had been mined to completion and was being reclaimed by the mine operator (see Figure 1). The reclamation process involved hauling truckloads of backfill material along the upper access road and dumping it at the top of the final sand embankment. A front-end loader was then used to push the material over the edge of the embankment.

Reclamation of the area had been ongoing intermittently for three years. This work was typically done in the winter when it was too cold to operate the wet processing plant for aggregate production. The lower access road separated the reclamation dump site from the active mining portion of the pit and traversed the slope uphill in an east to west direction.

Material had been dumped daily for three consecutive weeks prior to the accident and, on average, consisted of 60 truckloads of material per day. On the day of the accident, material had been pushed from the top of the embankment between 7:00 a.m. and 7:30 a.m. and between 12:00 p.m. and 12:30 p.m. Around 1:00 p.m., Boland drove along the lower access road, parked and exited his vehicle, and climbed the embankment when a large amount of material failed engulfing him.

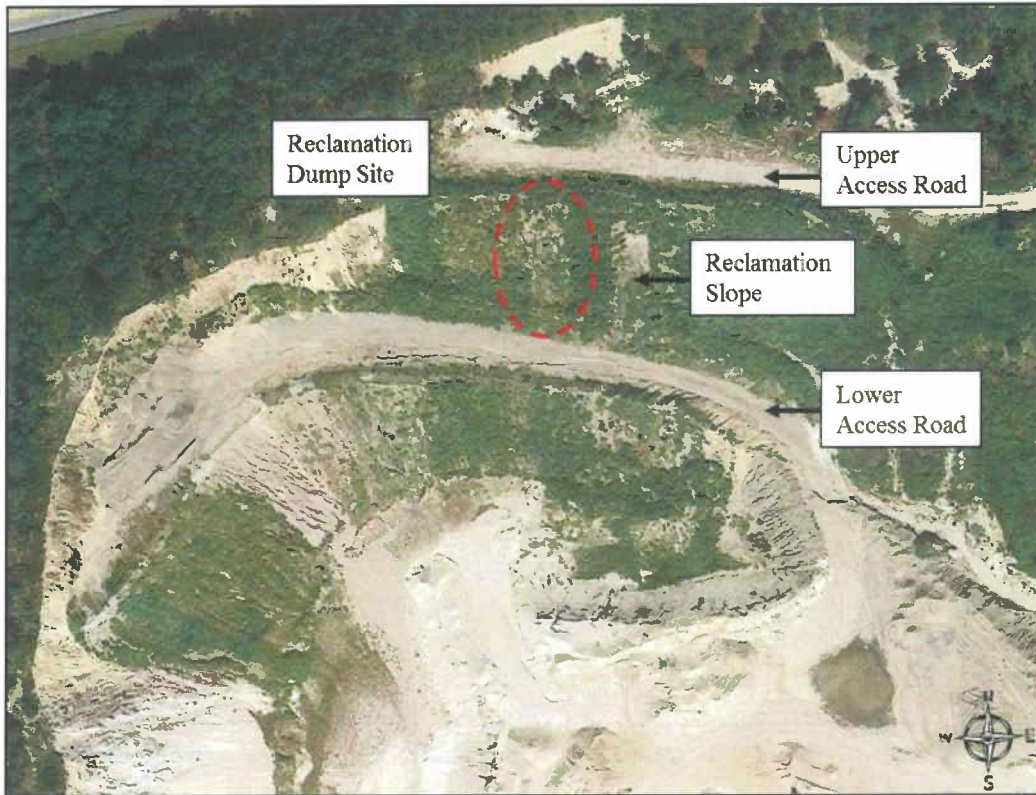


Figure 1 – Aerial view of the northwest corner of the mine (September, 2013).
The approximate location of the failure zone is highlighted in red.

Weather

On the day of the accident, the weather was fair with visibility reported as 10 miles. According to management personnel interviewed, the reclamation dump site could be seen from the two mine office trailers located approximately one-half mile away. The high and low temperatures were 23 degree Fahrenheit and 1 degree Fahrenheit, respectively. This was the coldest day recorded in the area since January 29, 2014. The temperature remained at or below freezing for four days prior to the slope failure with the exception of two, 2-hour time periods on February 25 and 26, 2014, when the temperature rose above freezing. The last measureable amount of precipitation (0.04 inches of rain) was recorded on February 24, 2014, when the temperature reached a high of 41 degrees Fahrenheit. Weather was considered to be a contributing factor in the reclamation slope failure.

Description of the Slope Failure

The slope was measured to be 80 feet high (see Figure 2) at the failed area, approximately 180 feet east of the western edge of the area being reclaimed. The failure plane was limited to the reclamation material and did not extend into the final sand embankment remaining at the completion of mining. The reclamation slopes were measured to be 1.2 H:1V (i.e., horizontal : vertical) or about 40 degrees at the areas directly adjacent to the failed area. Based on the final sand slope contours obtained from the mine operator, the thickness of the reclamation material over the sand slope was estimated to be between 10 and 20 feet.

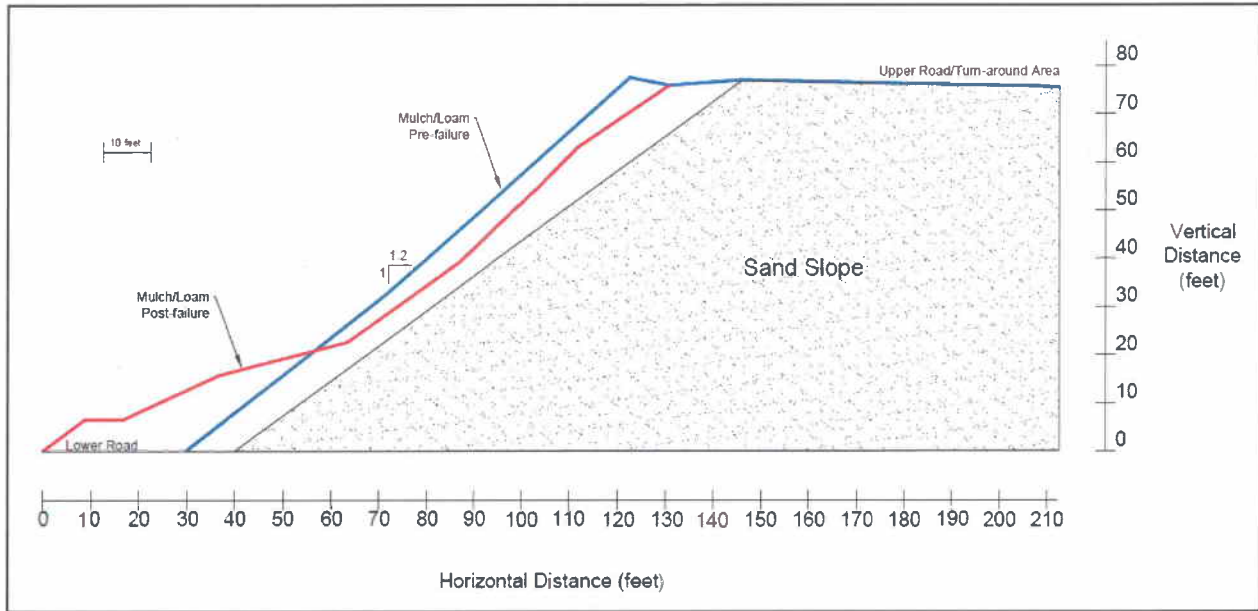


Figure 2 - Typical cross-sections for the slope conditions prior to and post failure.

The remaining void left by the sliding material was 88 feet wide at the top of the slope. The slide debris was approximately 110 feet wide at the bottom of the slope (see Figure 3). The slide debris covered a portion of the 30-foot wide lower access road at the base of the slope. The estimated amount of material displaced during the failure was approximately 1,600 cubic yards. Water was not observed seeping from the failure area or along the portions of the slope that did not fail. Slight bulges were observed toward the bottom of the reclamation slope on both sides of the failure area. At the top of the slope, investigators observed tension cracks, up to several inches wide, in the reclamation material. However, they did not observe any significant vertical displacement along these existing cracks. Tension cracks are common at similar dump sites and necessitate the use of dozers or front-end loaders to push the material over the top of the embankment.

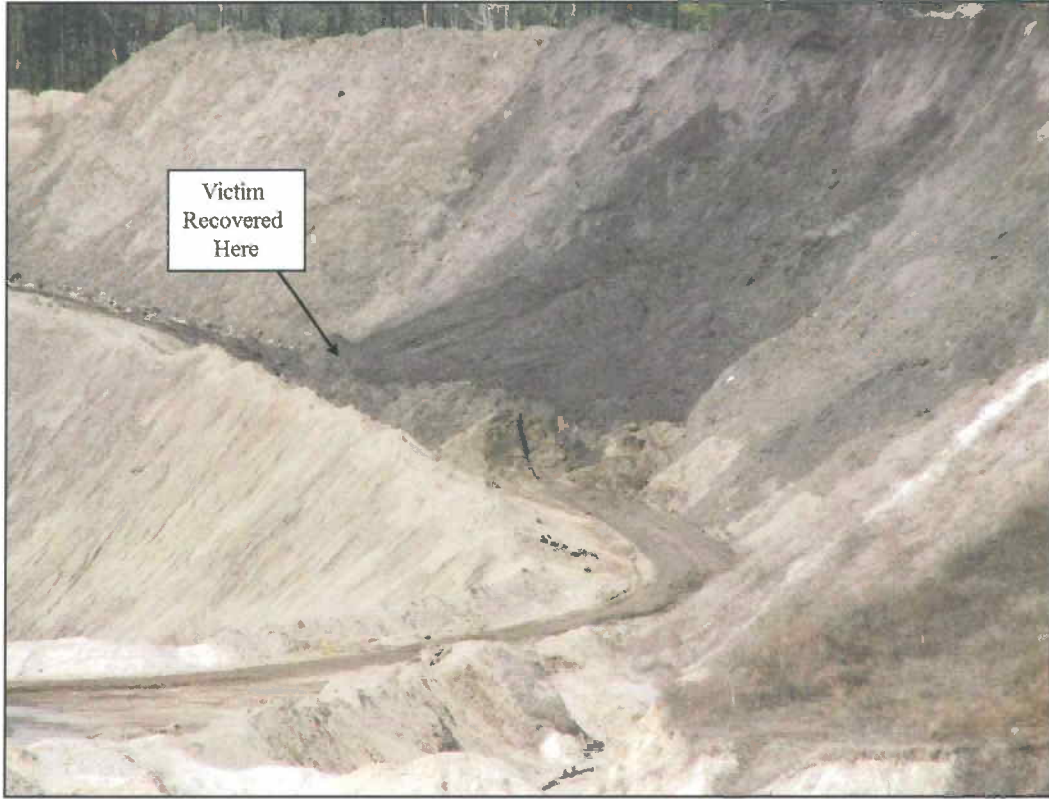


Figure 3 – View of reclamation dump site and failure looking toward the northwest.

According to the mine operator, the material being used to reclaim the area was a mixture of approximately 70 percent loam and 30 percent mulch (see Figure 4). Due to its composition, the loam/mulch mixture behaved differently than a typical soil backfill under similar placement conditions. That is, when dry soil is dumped, it naturally settles to its angle of repose, or the maximum angle that a stable slope will maintain due to friction between soil particles. The loam/mulch mix contains organic material which causes it to lose volume and generate heat as it decomposes. The slight bulges on both sides of the failed area may be due to the changing material characteristics from decomposition.

The relatively slow decomposition of the mulch portion of the reclamation material (shrinking volume) could have caused the areas that did not fail to shift slightly downward over the three-year-long reclamation process. The moisture content, the frozen condition, and the fibrous nature of the loam/mulch mixture could have allowed the material to hold itself in a slightly over-steepened state. The material dumped on the day of the accident added an additional load and could have created a slope that was marginally stable. The relatively warm material (woody mulch) may have thawed the frozen mulch already in place. A combination of these factors caused a temporary reduction of shear strength within the reclamation material causing the marginally stable slope to fail.



Figure 4 – Close-up view of failed backfill material composed of loam and mulch.

TRAINING AND EXPERIENCE

Declan J. Boland (victim) had 27 years of mining experience including 12 years, 12 weeks at this mine. A representative of MSHA's Educational Field Services reviewed the mine operator's training records and found the required annual refresher training for Boland and seven other miners had expired. A noncontributory 104(g)(1) Order was issued. The seven miners were withdrawn until the required training was provided.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following root cause was identified:

Root Cause: Management failed to establish methods to maintain the slope stability at the reclamation dump site where miners worked or traveled in performing their assigned tasks. The approximately 80-foot high embankment failed and engulfed the victim.

Corrective Action: Management modified the reclamation plan at the mine to include using additional material fill to form a flatter slope which can be maintained using a dozer. In addition, management abandoned the lower access road by permanently blocking the east and west approaches to the roadway. These revisions eliminate the need for persons to travel near the base of the slope.

CONCLUSION

The accident occurred due to the management's failure to establish methods to maintain the slope stability at the reclamation dump site where miners worked or traveled in performing their assigned tasks. The material being used to reclaim the area was a mixture of approximately 70 percent loam and 30 percent mulch. The moisture content, the frozen condition, and the fibrous nature of the loam/mulch mixture could have allowed the material to hold itself in a slightly over-steepened state. The material dumped on the day of the accident added an additional load and could have created a slope that was marginally stable. The relatively warm material (woody mulch) could have thawed the frozen mulch already in place. A combination of these factors caused a temporary reduction of shear strength within the reclamation material causing the marginally stable slope to fail.

ENFORCEMENT ACTIONS

Issued to East Coast Mines Ltd.

Order No. 8796389 - Issued on February 28, 2014, under the provisions of Section 103(j) of the Mine Act:

An accident occurred at this operation on 2/28/2014 at approximately 1330. This order is being issued, under section 103(j) of the Federal Mine Safety and Health Act of 1977, 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 mine site and pit north of the scale house until MSHA has determined that it is safe to resume normal mining operations in this area. This order was initially issued orally to Carrie Tintle at 1424 by Kevin Hardester and has now been reduced to writing.

The order was subsequently modified to Section 103(k) after an Authorized Representative arrived at the mine. This order was terminated on March 3, 2014, after conditions that contributed to the accident no longer existed.

Citation No. 8798227 - Issued under the provisions of 104(a) of the Mine Act for violation of 30 CFR § 56.3130:

On February 28, 2014, a fatal accident occurred at this mine when a miner approached an approximate 80-foot high bank and it failed, engulfing him. Mining methods were not used to maintain the slope stability at this reclamation dump site where miners worked or traveled in performing their assigned tasks. The material being used to reclaim the area was a mixture of approximately 70 percent loam and 30 percent mulch. The thickness of the reclamation material over the sand slope was estimated to be between 10 and 20 feet. The reclamation slopes were measured to be about 40 degrees directly adjacent to the failed area. The estimated amount of material displaced during the failure was approximately 1,600 cubic yards.

Approved by: K. H. Abel for.
Donald J. Foster, Jr.
District Manager

Date: 5/19/2014

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

East Coast Mines Ltd.

John B. Tintle	President
Eduardo Arias	Mechanic
Aidan F. Boland	Front-end Loader Operator
Juan Carlos	Haul Truck Operator
Brian W. Downs	Front-end Loader Operator
Michael B. Partridge	Front-end Loader Operator

Southampton Town Police Department

Charles O. Sharkey, Jr.	Detective
Timothy Wilson	Detective

Occupational Safety and Health Administration

Brian Calliari	Compliance Safety & Health Officer
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Mine Safety and Health Administration

Thomas J. Shilling	Mine Safety & Health Inspector
Gary C. Merwine	Mine Safety & Health Inspector
James B. Pfeifer	Civil Engineer
Megan N. Lavage	Civil Engineer
Gregory J. Mehalchick	Mine Safety & Health Specialist (Training)

APPENDIX B

VICTIM INFORMATION

Accident Investigation Data - Victim Information												U.S. Department of Labor											
Event Number: 6 6 3 0 7 8 2												Mine Safety and Health Administration											
Victim Information: 1																							
1. Name of Injured/Ill Employee: <i>Declan J. Boland</i>				2. Sex: <i>M</i>		3. Victim's Age: <i>50</i>		4. Degree of Injury: <i>01 Fatal</i>															
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 02/28/2014 b. Time: 14:30</i>										6. Date and Time Started: <i>a. Date: 02/28/2014 b. Time: 13:30</i>													
7. Regular Job Title: <i>049 Supervisor/ Safety Director</i>					8. Work Activity when Injured: <i>042 Checking a smoldering spot in the mulch</i>					9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>													
10. Experience			Years			Weeks			Days			b. Regular			c. This			d. Total					
Work Activity:			<i>3</i>			<i>0</i>			<i>0</i>			Job Title:			<i>27</i>			<i>0</i>			<i>0</i>		
11. What Directly Inflicted Injury or Illness? <i>127 70%mulch 30% loam mixture</i>										12. Nature of Injury or Illness: <i>390 asphyxiation</i>													
13. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner</i> Annual: <input checked="" type="checkbox"/> Task: <input type="checkbox"/>																							
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: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> EMT: <input checked="" type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input 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>													