Driller Caught and Crushed between Tracked Drill and Truck

Type of Incident: Fatality
Date of Incident: December 16, 2010

May 2, 2011

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SECTION 1.0 DATE AND TIME OF INCIDENT

1.1 The incident occurred on December 16, 2010 at approximately 6:30 p.m.

SECTION 2.0 NAME AND ADDRESS OF PRINCIPAL PARTIES

2.1 Owner(s)

2.1.1 Coral Hill Energy Ltd.
Suite 1100, 520-5 Avenue
Calgary
Alberta
T2P 3R7

2.2 Prime Contractor

2.2.1 Outsource Seismic 2008 Inc.
1200, 101-6 Avenue SW
Calgary
Alberta
T2P 3P4

2.3 Employer(s)

2.3.1 Clean Harbors Exploration Services Ltd.
PO Box 1038
5301-57 Avenue
Grimshaw
Alberta
T01 1W0

2.4 Contractor(s)

2.4.1 Not Applicable

2.5 Supplier(s)

2.5.1 Multi-Power Products Ltd.
975 Crowley Avenue
Kelowna
British Columbia
V1Y 9R6

2.6 Worker(s)

2.6.1 The Driller (t)

2.6.2 The Helper

2.6.3 The Water Hauler (

2.7 Others

2.7.1 Not applicable

SECTION 3.0 DESCRIPTION OF PRINCIPAL PARTIES

3.1 Coral Hill Energy Ltd. is a privately held company based in Calgary, Alberta, specializing in oil exploration using well data to identify oil bearing lands.

3.2 Outsource Seismic 2008 Inc. is a geophysical operations company providing the oil and gas industry with full-service seismic project management services. The company is based in Calgary Alberta.

3.3 Clean Harbors Exploration Ltd. provides environmental, energy and industrial services throughout North America and internationally. The Alberta Exploration Services division is located in Grimshaw Alberta. The corporate head office is in Norwell, Massachusetts USA.

3.4 Multi-Power Products Ltd. specializes in the design and manufacture of hydraulic and pneumatic products.

SECTION 4.0 LOCATION OF INCIDENT

4.1 The Outsource Environmental Virginia Hills 3D geophysical program area, approximately 35 square kilometres of forested Crown land centred approximately 30 km west of the town of Swan Hills, Alberta. The incident occurred on an access road leading from Staging Area 2, located at the northwest of the survey area, approximately 600 m southwest of the Staging Area. (Attachment A – Map) (Attachment B – Diagram).

SECTION 5.0 EQUIPMENT, MATERIAL AND OBSERVATIONS

5.1 Equipment and Material

5.1.1 Morooka Shot Hole Drill

5.1.1.1 The shot hole drill was one of a fleet of vehicles based on a rubber tracked carrier vehicle manufactured by Morooka in Japan. The shot hole drill was manufactured by Multi-Power Products Ltd. using Morooka parts but specifically built to Multi-Power Products Ltd.'s designs in accordance with Clean Harbors Exploration Ltd. specifications. (Attachment C – Photograph #9)

5.1.1.2 The shot hole drill involved in the incident was manufactured in 2008 and identified as Model Name Challenger C22, Serial Number SN001-2577-26468-01. The vehicle carried a Manufacturer's Identity Number MPP-001-2577 and an Owner's Identity Number 79TRA363.

5.1.2 Ford F350 4X4 Crew Cab Pickup Truck (Attachment C – Photographs #6, #8)

5.1.2.1 The Ford F350 pickup truck involved in the incident was manufactured in 2007. The vehicle was identified by VIN Number 1FTWW31R08EC29882 and Alberta license plate EMF-755. The Owner's Identity Number was 79283. The vehicle was fitted with an auxiliary fuel tank in the truck bed with a capacity of 429 l of diesel fuel.

5.2 Observations

5.2.1 Weather data was obtained for the date of the incident from Environment Canada for Whitecourt, approximately 70 km south of Swan Hills. At 6:00 p.m. the temperature was minus 18 Celsius, with a wind speed of zero. During the on-site investigation carried out on December 17, 2010 investigators observed significant snow at the scene, with approximately 30-40 cm of snow on the ground close to the access roads.

5.2.2 After the incident occurred, a request was made by the on-site EMS responder to have a helicopter fly from Swan Hills to airlift the injured worker from the site to hospital. The helicopter could not be deployed because of ice fog and the injured worker was transported from the site to hospital by ground ambulance.

SECTION 6.0 NARRATIVE DESCRIPTION OF THE INCIDENT

6.1 Clean Harbors Exploration Ltd. were contracted by Outsource Seismic 2008 Inc. to drill and load approximately 1921 shot hole points with explosives as part of a seismic exploration west of the town of Swan Hills.

6.2 On December 16, 2010 the Driller and the Helper) drove the Ford F350 truck from Swan Hills to the work site, arriving at Staging Area 2 at approximately 10:00 a.m., after collecting some supplies in town. The Driller ( ) and the Helper (a) fuelled the shot hole drill with fuel from the auxiliary fuel tank on the truck, loaded their magazine with explosives received from the Powder Custodian ( ) then headed out on the access road to their designated work location and started to drill and fill shot holes.

6.3 The shot hole drill was working well until the team started to drill their last hole. A part of the drilling mechanism known as a breakout fork broke away from the seismic drill rig. The crew picked up the breakout fork and headed back to Staging Area 2. The Helper ( ) was driving the shot hole drill and the Driller ( ) was driving the truck. The Water Hauler ( ) was leading them out, driving his water supply vehicle, a tracked vehicle similar to a shot hole drill but designed to carry and deliver water to the shot hole drills.

6.4 When the team was approximately 600 m from Staging Area 2 the shot hole drill ran out of fuel and came to a stop. The Driller ( ) was unable to position his truck close enough to the shot hole drill to be able to transfer fuel from the auxiliary fuel tank on his truck directly into the fuel tank on the shot hole drill. The Water Hauler ( ) used an empty windshield washer jug to transfer sufficient fuel from the auxiliary fuel tank on the truck into the fuel tank on the shot hole drill so that the shot hole drill could be restarted and driven to Staging Area 2.

6.5 Since the engine on the shot hole drill had stalled out after running out of fuel, it was necessary to bleed the fuel system on the engine before it could be restarted. To access the engine, which was located between the seats in the cab of the shot hole drill, panels were removed from the sides of the engine cover and then the engine cover was raised. The side panels were removed by the Driller and handed to the Water Hauler (who was outside the cab. The Water Hauler) placed the panels onto the bumper at the front of the seismic drill rig. (Attachment C – Photographs #3, #4)

6.6 The Driller (bled out the fuel system on the engine and lowered the engine cover back into place. The Driller attempted to restart the engine, but cranking the engine caused the battery on the seismic drill rig to lose power and fail. The Driller (pulled his truck up alongside the seismic drill rig and connected the battery on the truck to the battery on the seismic drill rig with booster cables.

6.7 The engine on the shot hole drill re-started, but the truck was now stuck in the snow alongside the seismic drill rig. The Driller (repositioned the shot hole drill slightly in preparation for transferring more fuel from the auxiliary fuel tank on the truck into the fuel tank on the shot hole drill. The shot hole drill was facing towards Staging Area 2, and the truck was alongside the shot hole drill facing away from Staging Area 2.

6.8 The Driller (jumped out of the cab of the shot hole drill to put the engine cover panels back into the cab. The Driller ( ) threw one of the engine cover panels into the cab of the shot hole drill. The engine cover panel landed on top of the engine cover and depressed the two track control levers that were mounted on the top of the engine cover. The weight of the engine cover panel pushed the track control levers fully forward, causing the shot hole drill to start moving forwards, towards Staging Area 2.

6.9 The Driller (t) attempted to jump back into the cab to stop the shot hole drill, but the front of the shot hole drill caught the driver's door of the truck and the Driller (was caught between the truck and the moving shot hole drill. The shot hole drill pushed the truck, with the Driller ( ) caught between the two vehicles, approximately 10 m before the truck broke free. The shot hole drill continued to head towards Staging Area 2 and the Driller (was left lying on the ground behind the truck. The incident occurred at approximately 6:30 p.m.(Attachment C – Photographs #5, #6, #7, #8)

6.10 The Water Hauler ( ) had driven his water supply vehicle to Staging Area 2 and refueled. He realized that he had a tow chain from the shot hole drill, and that the shot hole drill crew would likely need the chain to pull the truck out of the snow. The Water Hauler, ( ) was heading back towards the shot hole drill when he saw the shot hole drill start to move and head towards him. As it passed by him he realized that there was no driver in the shot hole drill. The Water Hauler ( ) continued to where the truck was left on the road and found the Helper ( ) standing over the Driller ( ) at the rear of the truck. The Helper ( ) directed the Water Hauler ( ) to call a medic. The Water Hauler ( ) used his radio to summon the medic and then assisted the Helper ( ) to care for the Driller ( ) until the medic arrived. The Driller ( ) was conscious and able to move his limbs, but was in serious pain and told the Water Hauler ( ) to "pull out all the stops" and to call a helicopter.

6.11 The Medic ( ), who was based at another staging area on the site, arrived at the incident scene in approximately 10 minutes and took over care of the Driller ( ). When the Medic ( ) arrived, the Water Hauler ( ) drove to where the shot hole drill had become stuck in the bush, approximately 500 m from the truck. The Water Hauler ( ) was unable to enter the shot hole drill from the driver's side so he entered from the passenger side. The shot hole drill engine had stalled so the Water Hauler ( ) reached over the engine cover and turned off the key. The Water Hauler ( ) then saw that the engine cover panel was resting on the track controls.

6.12 The Water Hauler ( ) returned to the incident location. The Water Hauler ( ) realized that the medic's truck was likely stuck in the snow and instructed the Helper ( ) to hook up the medic truck to the water supply vehicle so that he could pull it free from the snow. The Driller ( ) was placed onto a spine board and lifted into the medic truck.

6.13 The Water Hauler used his water supply vehicle to pull the medic truck free. The Water Hauler (then drove the medic truck to a location where they were met by a ground ambulance. The Driller ( ) was transferred to the ambulance and taken to hospital. The Driller ( ) died later that night as a result of injuries suffered during the incident.

SECTION 7.0 ANALYSIS

7.1 Direct Cause

7.1.1 A self-propelled shot hole drill was left running with the control lever in the "Drive" position. The Driller (threw an engine cover panel into the cab from the outside. The panel landed on and depressed the track control levers, causing the seismic drill rig to move forward. The Driller was caught and crushed between the seismic drill rig and another vehicle, causing injuries that proved fatal.

7.2 Contributing Factors

7.2.1 The shot hole drill had a three-position switch at the driver's side of the cab. With the switch in the down "Drive" position the switch sends hydraulic power from the engine to the track control levers to drive the tracks. In the centre "Park" position the vehicle is in neutral and in the up "Drill" position the switch sends hydraulic power to the controls for the seismic drill at the back of the unit. After the Driller ( ) had repositioned the shot hole drill the switch had been left in the "Drive" position, so that when the panel landed on and depressed the track controls the vehicle started to move. If the switch had been left in the "Park" position this incident could not have occurred.

7.2.2 The Water Hauler ( ) stated that the shot hole drill had been leaking fuel during the day, and that the Driller ( ) was aware that there was a fuel leak. If the crew had monitored the fuel remaining and refueled before the vehicle ran out of fuel it would not have been necessary to bleed the fuel system on the engine and this incident would not have occurred.

SECTION 8.0 FOLLOW-UP/ ACTION TAKEN

8.1 Alberta Employment and Immigration; Occupational Health and Safety

8.1.1 Occupational Health and Safety wrote orders to Clean Harbors Exploration Ltd. to review their policies for training workers, and for assessing the competency of workers.

8.1.2 Occupational Health and Safety wrote orders to Outsource Seismic 2008 Inc. to revisit their policies and procedures when, as prime contractor, they are responsible for ensuring that the Occupational Health and Safety Act, Regulations and Code are complied with at a work site.

8.1.3 Occupational Health and Safety wrote orders for information to Clean Harbors Exploration Ltd. and Outsource Seismic 2008 Inc.

8.2 Industry

8.2.1 Clean Harbors Exploration Ltd. instituted safety stand-downs to review the incident and to communicate their investigation findings and prevention measures to their crews.

8.2.2 Clean Harbors Exploration Ltd. reviewed and modified their procedures for training and assessing the competency of their workers.

8.2.3 Clean Harbors Exploration Ltd. re-engineered the control system on their Morooka shot hole drills to prevent unintentional activation of the track control levers.

8.2.4 Clean Harbors Exploration Ltd. issued an industry alert through the Enform (industry safety association) website.

8.2.5 Outsource Seismic 2008 Inc. reviewed and improved their procedures for hiring contractors and for managing sites where they are the prime contractor.

8.3 Additional Measures

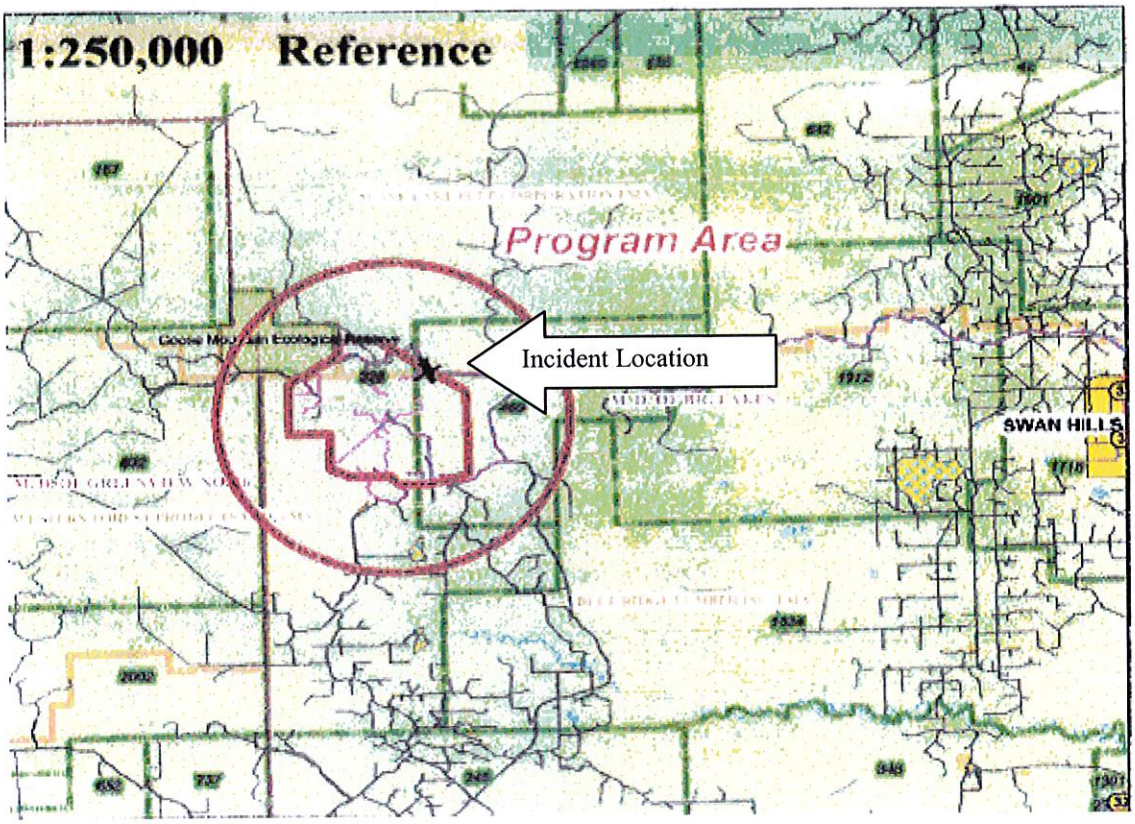
8.3.1 No additional measures were required.

SECTION 9.0 SIGNATURES

Ted Lane, Lead Investigator	Date
Dwayne Barrett, Investigator	Date
Gerry Wagner, Manager	Date
Joanne Garton, Regional Director, North	Date

SECTION 10.0 ATTACHMENTS:

Attachment A	Map
Attachment B	Diagram
Attachment C	Photographs



Map showing incident location at Outsource Scientific Virginia Hills 3D Project.

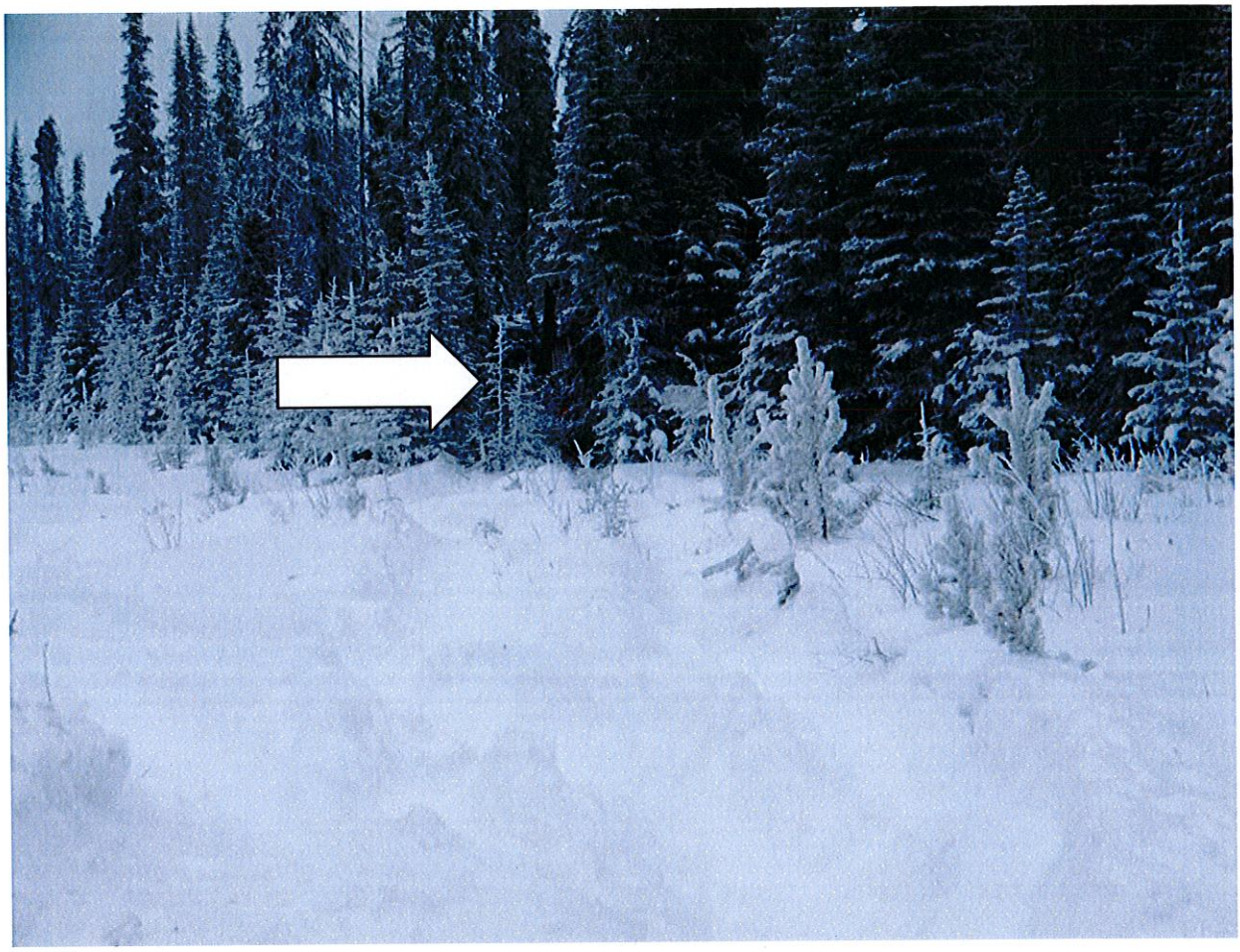
Government of Alberta
Employment and Immigration

File: F- 408383
Attachment "B" - Diagram
Scale 1 - 4000

Aerial Photograph Showing GPS Coordinates of Incident Location

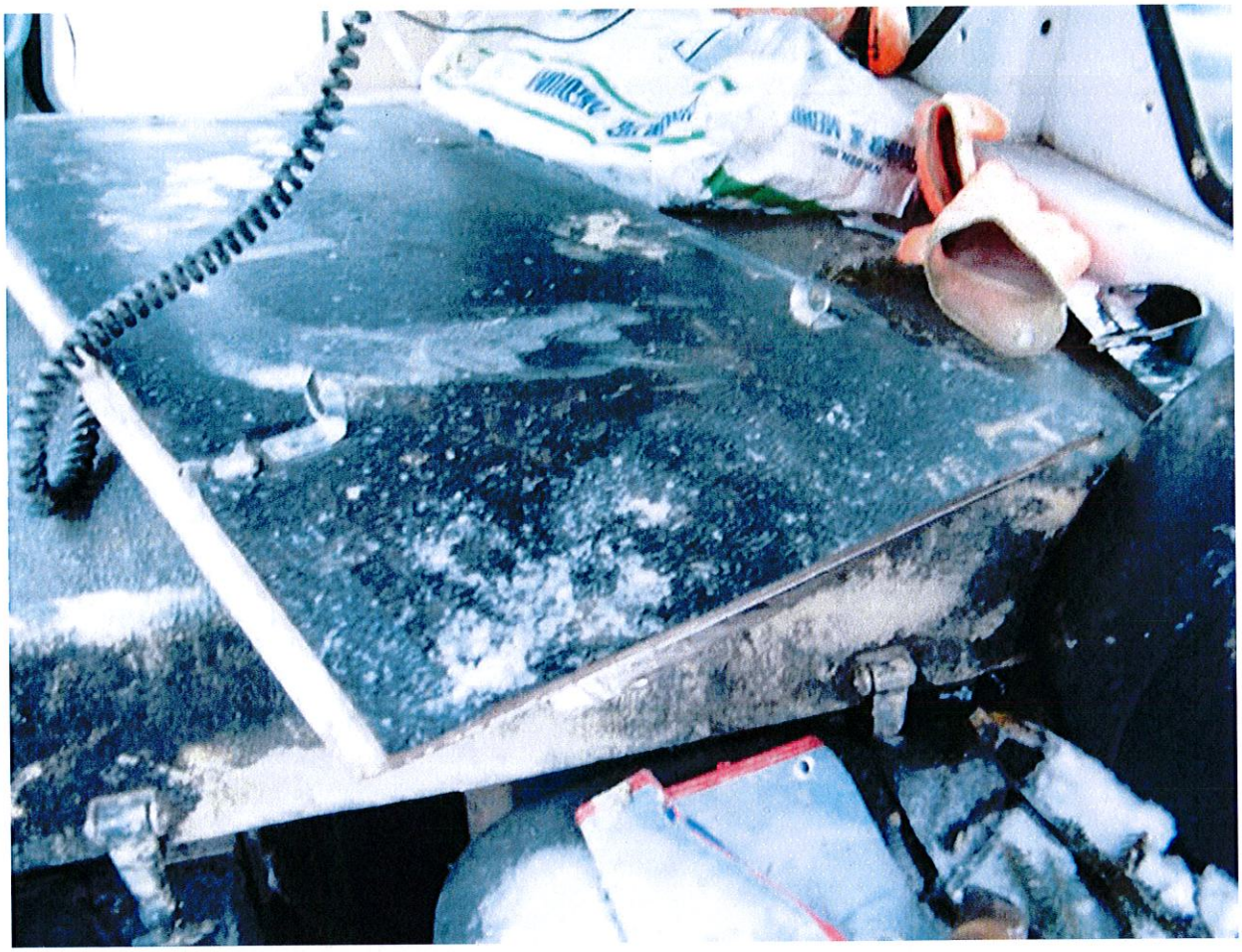
Alberta Employment and Immigration, Occupational Health and Safety

March 10, 2011
ZM

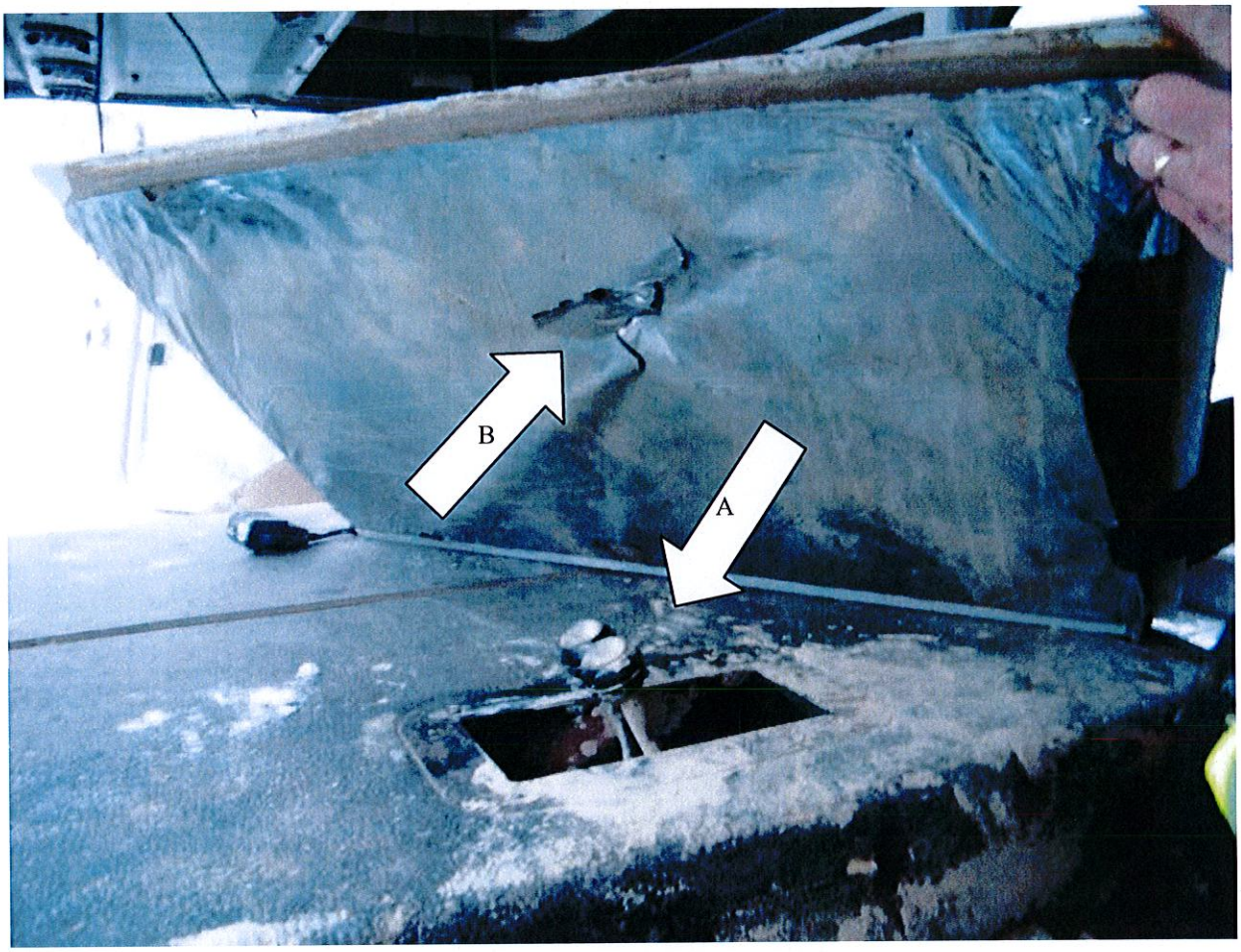


Photograph #1	Looking approximately west from where the shot hole drill left the Staging Area 2 access road. The photograph shows tracks left in the snow by the shot hole drill. Arrow shows the shot hole drill in the bush where it stalled out.

Photograph #2	Shows a rear view of the shot hole drill stalled out in the bush. Photograph shows the track through the bush created by the shot hole drill.

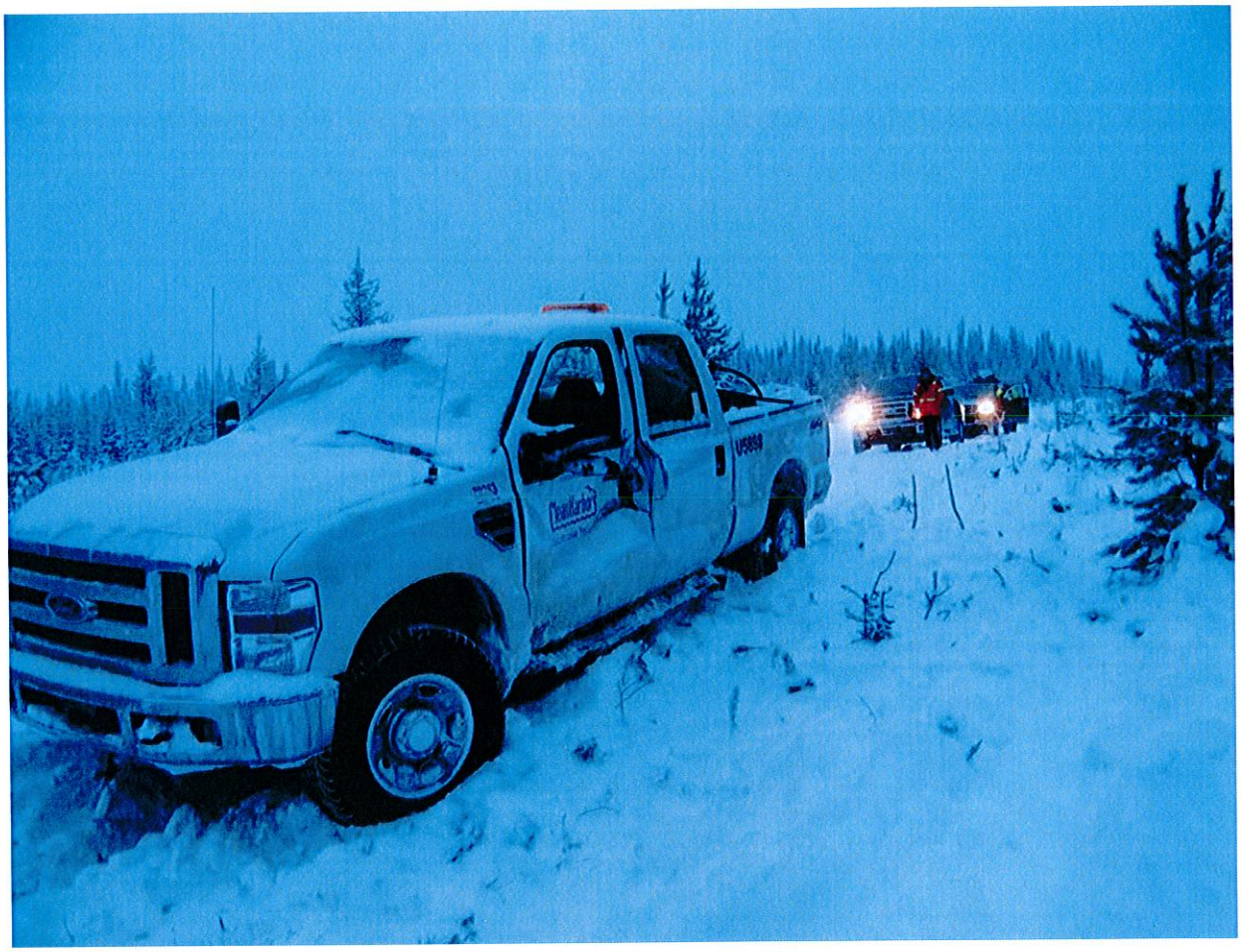


Photograph #3	Shows the interior of the shot hole drill cab looking from the driver's side door. The side panel from the driver's side of the engine cover is resting on top of the engine cover, depressing the track control levers.



Photograph #4	Shows the side panel lifted from the top of the engine cover. Arrow "A" shows the track control levers. Arrow "B" shows a hole left in the insulation lining the side panel made by the track control levers.

Photograph #5	Looking approximately southwest from where the shot hole drill left the staging Area 2 access road. Shows where the Ford F350 pickup truck was left after the incident.



Photograph #6	Showing damage on the driver's side of the pickup truck. The Driller was caught and crushed between this side of the truck and the driver's side of the shot hole drill.

Photograph # 7 Shows a close-up view of the damage to the pickup truck.

Photograph #8	Shows the auxiliary fuel tank and pump in the box of the pickup truck.

Photograph #9 Shows another shot hole drill the same as the vehicle involved in the incident.