Workplace Health and Safety
Fatality Report

WORK SAFE ALBERTA

PICKUP TRUCK AND DRIVER CRUSHED BY HEAVY HAULER
Date of Incident: April 26, 2008
Type of Incident: Fatality

Alberta Employment and Immigration

TABLE OF CONTENTS

SECTION 1.0 DATE AND TIME OF INCIDENT

1.1 The incident occurred on April 26, 2008 at approximately 8:00 p.m.

SECTION 2.0 NAME AND ADDRESS OF PRINCIPAL PARTIES

2.1 Owner

2.1.1 Albian Sands Energy Inc.
PO Box 5670
Fort McMurray, Alberta
T9H 4W1

2.2 Prime Contractor

2.2.1 Albian Sands Energy Inc.
PO Box 5670
Fort McMurray, Alberta
T9H 4W1

2.3 Employer

2.3.1 Bucyrus Canada Ltd.
18131-118 Avenue
Edmonton, Alberta
T5S 1M8

2.4 Contractor

2.4.1 Fort McKay Group of Companies
PO Box 5360
Fort McMurray, Alberta
T9H 3G4

2.5 Supplier(s)

2.5.1 Not applicable

2.6 Worker

2.6.1 The Electrician

2.7 Others

2.7.1 Not applicable

SECTION 3.0 DESCRIPTION OF PRINCIPAL PARTIES

3.1 Albian Sands Energy Inc. is a joint venture oil sands operation. The operations include an open pit mine, an ore preparation area, a bitumen extraction facility and a hydrocarbon mixing facility. The company transports diluted bitumen through a pipeline to Shell's upgrader in Fort Saskatchewan, Alberta.

3.2 Bucyrus Canada Ltd. is a wholly owned subsidiary of Bucyrus International Inc., a manufacturer of electric mining shovels. Bucyrus Canada Ltd. has a contract with Albian Sands Energy Inc. to provide personnel and materials for maintaining 6 electric shovels operating in Albian Sands Energy Inc.'s Muskeg River Mine.

3.3 Fort McKay Group of Companies has a contract with Albian Sands Energy Inc. to provide personnel for maintenance and other duties at Albian Sands Energy Inc.'s Muskeg River Mine.

SECTION 4.0 LOCATION OF INCIDENT

4.1 Albian Sands Energy Inc. Muskeg River Mine is located approximately 75 km north of Fort McMurray, Alberta. The incident occurred at the top of a ramp leading from the mine to the Crusher Pad, at the intersection where the ramp enters the Crusher Pad. (Attachment "A", Map). (Attachment "B", Diagram) (Attachment "C", Photograph #1)

SECTION 5.0 EQUIPMENT, MATERIAL AND OBSERVATIONS

5.1 Equipment and Material

5.1.1 **The Muskeg River Mine**

5.1.1.1 The Muskeg River Mine is located on Lease 13, a 121 square kilometre area. (Attachment "A", Map) The Muskeg River Mine is an open pit mining operation that mines oil sand and processes the oil sand to extract heavy oil, called bitumen. The design production capacity is 155,000 barrels of bitumen per day. The oil sand is extracted by large shovels and transported to the crusher by heavy haul trucks. After processing to remove the bitumen, the processed sand is returned to the pit and the site is reclaimed. Bitumen is extracted at a plant on the mine site and then transported by pipeline to an upgrader located near Fort Saskatchewan, Alberta.

5.1.2 **The Crusher Pad**

5.1.2.1 The Crusher Pad is a large flat roughly rectangular area approximately 180 m by 200 m. At the south-east side of the pad two haul roads enter the pad. The ramp rising from the mine enters at the northeast corner of the pad, and a road leading to the processing and administration areas enters from the south-east corner of the pad. Crusher inlet chutes leading into two crushers are located on the north-west side of the pad. Each crusher inlet chute has two dump blocks where heavy haulers can dump their loads. Heavy haulers are parked on the pad during shift changes and also when they are awaiting instruction to travel to a shovel to be loaded. (Attachment "B", Sketch) (Attachment "C", Photograph #2)

5.1.3 **The Heavy Haul Truck**

5.1.3.1 The heavy haul truck that was involved in the incident is a Caterpillar 797B off-road mining truck. The vehicle is owned by Albian Sands Energy Inc. and identified as Haul Truck #122. The vehicle has a gross weight of 279,800 kg and a loaded operating weight of 623,500 kg. The vehicle was empty at the time of the incident. The vehicle has a wheelbase of 7.18 m, and an overall length of 14.53 m. The vehicle is 9.75 m wide and 7.6 m high. (Attachment "C", Photographs #1, #3, #4, #16)

5.1.3.2 Heavy haul trucks operating in the Muskeg River Mine are directed and tracked by a computer-based Modular Mining System that includes GPS tracking. Operators of heavy haul trucks receive electronic dispatch messages on the computer screen to give them directions to proceed to a shovel and load. After loading, the operator is instructed which crusher to dump into. The operator will dump at whichever dump block is available at the crusher inlet chute.

5.1.4 **The Pickup Truck**

5.1.4.1 The pickup truck that was involved in the incident was a 2004 Ford F250 Crew-cab. The vehicle was owned by Albian Sands Energy Inc. and identified as Unit #479. The vehicle was fitted with a buggy whip and flashing amber light. Light vehicles operating in the mine are also required to have their lights on at all times. (Attachment "C", Photographs #3, #5, #6, #15)

5.2 Observations

5.2.1 Weather data was obtained for Fort McMurray for the day of the incident. At 8:00 p.m. the weather was recorded as clear, with a temperature of 3.7 degrees Celsius and a wind speed of 15 km/h from the north. A historic record of sunrise and sunset times was not available for Fort McMurray, but was obtained for Edmonton for the day of the incident. The sunset time at Edmonton was 7:56 p.m. With a clear sky, the driver of the pickup would have been driving towards the light from the setting sun at the time of the incident.

SECTION 6.0 NARRATIVE DESCRIPTION OF THE INCIDENT

6.1 On April 26, 2008, at 6:46 p.m., the Operator logged onto Haul Truck #122 at the crusher pad, to start her shift. At 6:55 p.m., after carrying out vehicle checks, Truck #122 was assigned to collect a load from Shovel 3 in the mine. The Operator, drove Truck #122 to shovel 3, arriving at 7:07 p.m. At 7:09 p.m. the loading had been completed and Truck #122 was assigned to travel to the Crusher Pad. The Operator drove Truck #122 to the Crusher Pad, arriving at 7:20 p.m. where the load was dumped into the crusher chute.

6.2 At 7:21 p.m. Truck #122 was again assigned to travel to Shovel 3, and completed this trip by returning to the Crusher Pad and dumping the load into the crusher chute at 7:45 p.m. After dumping the load, the Operator parked Truck #122 at the northeast side of the crusher pad, waiting for further instructions.

6.3 The Electrician had started his shift at 8:00 a.m. on April 26, 2008, and was scheduled to finish work at 8:00 p.m. There was a problem on Shovel 5 and two Bucyrus Canada workers, including the Electrician agreed to stay late to complete the repairs to Shovel 5.

6.4 The Electrician stopped at the Shovel 1 switch house at 7:55 p.m. to lock it out. At approximately 8:00 p.m. the Electrician was driving a pickup from the mine towards the Mine Maintenance Shop, driving up the ramp from the mine to the Crusher Pad, intending to cross the Crusher Pad.

6.5 At 8:01 p.m. Truck #122 was assigned to travel to Shovel 4. The Operator moved Truck #122 from where she had parked, and traveled across the northeast section of the Crusher Pad to turn left onto the ramp and head into the mine. Truck #122 was recorded by the tracking system, reaching the top of the ramp at 8:02:48 p.m.

6.6 Another Operator, operating Truck #102, also parked on the Crusher Pad awaiting instructions, was given an instruction to load, and followed behind Truck #122 across the Crusher Pad towards the ramp intersection. The Other Operator heard a radio call "light vehicle crossing the pad". The Other Operator observed that a pickup truck was stopped at the intersection, having driven up the ramp from the mine and onto the northeast corner of the Crusher Pad. (Attachment "B" Sketch) The Other Operator observed that another pickup truck was stopped on her right, waiting to cross the Crusher Pad, having been driven from the Rejects Area en-route to organize equipment that was in the mine area.

6.7 The Other Operator in Truck #102, observed Truck #122 turn left onto the ramp from the Crusher Pad. As Truck #122 made the turn, the left front wheel of Truck #122 struck the pickup being driven by the Electrician that was stopped at the top of the ramp entering the Crusher Pad. The left dual rear wheels of Truck #122 then ran over the pickup truck at an angle of approximately 45 degrees from the right front wheel of the pickup truck, crushing the hood and then the cab and the truck bed on the left side of the pickup truck. The Other Operator stopped Truck #102, used the radio system to tell Truck #122 to stop and called in an emergency situation. (Attachment "C", Photographs #3, #4, #5, #6, #7)

6.8 The Site Emergency Response Team was activated and responded. The crushed vehicle was identified as Unit #479. The Electrician was cut out from the crushed pickup and transferred to hospital in Fort McMurray, where he died shortly after his arrival at hospital as a result of injuries sustained during the incident.

6.9 The radio call "light vehicle crossing the pad" was heard by several witnesses just before the incident. The pickup truck that had driven from the Rejects Area to the Crusher Pad was being driven by a Muskeg Mountain Ltd. Partnership (MMLP) worker who, together with a colleague, was heading into the mine to carry out maintenance duties. MMLP is part of the Fort McKay Group of Companies. The driver stated that he had not yet made a radio call, but he had heard the call just a few seconds before the incident. The radio call heard by witnesses was therefore made by the Electrician from his pickup, Unit #479.

6.10 The Operator operating Truck #122 did not see either pickup before the incident and she did not realize that she had run over the pickup truck until the emergency was called and she stopped her vehicle. The Operator did not hear the radio call "light vehicle crossing pad".

SECTION 7.0 ANALYSIS

7.1 Direct Cause

7.1.1 The Electrician, was fatally injured when the pickup truck he was driving was run over and crushed by a heavy haul truck at an intersection where a ramp leading from the mine entered the Crusher pad.

7.2 Contributing Factors

7.2.1 The Operator of the heavy haul truck #122 stated that she never saw the pickup until after the incident had occurred and an emergency had been called. Heavy haul truck operators have limited visibility close to the truck on the left-hand or driver's, side, because of the height of the driver's seat above ground, and blind spots caused by the frame of the cab and the large rear - view mirrors fitted to the vehicle on the left side. Tests carried out by Workplace Health and Safety Compliance and Albian Sands Energy Inc. showed that a Caterpillar 797B operator starts to lose sight of a pickup truck when the pickup truck is 7.5 m from the hauler on the left side front, and completely loses sight of the pickup truck when the pickup truck is 3.6 m from the hauler. These measurements were taken with the pickup truck outside the blind spots created by the cab frame and mirror. A pickup truck remaining in the blind spots would not be visible to the operator at any time. (Attachment "C", Photographs #8, #9,)

7.2.2 The Operator stated that she did not hear the radio call "light vehicle crossing the pad". When Workplace Health and Safety Compliance were interviewing witnesses and other workers during the course of the investigation information was obtained that the site radio system often had very heavy radio traffic and that calls could be missed, or cut off by another radio call. This was confirmed when the radio system was used to shut down a section of haul road, in order to allow Workplace Health and Safety Compliance and Albian Sands Energy Inc. to test and measure the visibility for the operator of a 787B heavy haul truck. During the tests, carried out on the closed section of haul road, two heavy haul vehicles entered the closed road section, having failed to hear or understand several radio calls that were made to establish the road closure.

7.2.3 The Electrician, stopped his pickup truck after he had passed a berm at the intersection where the ramp enters the Crusher Pad and he had already entered the northeast corner of the Crusher Pad. The vehicle was stopped with the rear of the vehicle approximately 4.5 m clear of the top of the berm. The right side of the vehicle was also approximately 6.5 m out from the side of the road. The pickup truck was stopped in a location where it was vulnerable to contact with a heavy haul truck pulling off the Crusher Pad onto the ramp. It is not known precisely how long the pickup truck had been stationary at this location before the incident occurred, or why the pickup truck had stopped a considerable distance (6.5m) out from the side of the roadway. The Electrician was driving almost directly towards the setting sun as he approached the top of the ramp, and his vision would have been affected by the light from the sun.

7.2.4 There are two dump slots located at each crusher chute. When a heavy hauler was required to dump at the dump block closest to the northwest corner of the Crusher Pad the vehicle was required to make a “wrong side of the road” circuit into and away from the dump block. The Operator had dumped at this dump block before parking Truck #122 on the northwest side of the pad. When she moved out onto the pad to take the corner she was making a transition from “wrong side driving” and was positioned close to the berm at the intersection.

7.2.5 Workers driving light vehicles on the Muskeg River Mine site are required to complete a Mine Driver training course and to operate the vehicle in accordance with Albian Sands Work Practices. The Electrician had completed the Mine Driver training course and was qualified to operate a light vehicle in the mine. Heavy haulers always have right-of-way over light vehicles. Drivers of light vehicles in the mine are instructed to approach heavy equipment from the front and cab side of the heavy equipment, and to stop and remain at least 50 m away from heavy equipment until visual or radio communication is made with the heavy equipment operator. Acknowledgement from the operator of the heavy equipment must be received before moving any closer. Albian Sands Work Practices instructions clearly describe the limited visibility from the cab of a heavy equipment operator, and contain the instruction “Never assume the operator of heavy equipment can see you”. The Electrician had positioned his pickup truck closer than 50 meters away from heavy haul trucks that were positioned on the Crusher Pad, and had not obtained authorization from the Operator of a moving heavy haul truck to approach. However, had he stopped further back from the pad his view of the pad would have been blocked by the berm on his right side.

7.2.6 Workplace Health and Safety Compliance and Albian Sands Energy Inc. carried out checks to determine if heavy haul trucks operating or parked on the Crusher Pad were visible to drivers of light vehicles approaching the Crusher Pad on the ramp. It was found that heavy haulers on the pad were clearly visible from the base of the ramp and during most of the ascent. When approaching within 50 m of the intersection with the Crusher Pad the berm at the northeast corner of the Pad obscured the view of the heavy haulers. (Attachment "C", Photographs #12, #13, #14)

7.2.7 The Operator of the heavy haul truck #122 at the time of the incident was a qualified and experienced operator.

SECTION 8.0 FOLLOW-UP/ ACTION TAKEN

8.1 Employment and Immigration; Workplace Health and Safety Compliance

8.1.2 Workplace Health and Safety Compliance issued a Stop Use Order to Albian Sands Energy Inc. to secure the scene of the incident. During the period that the Stop Use Order was in force Albian Sands Energy Inc., in discussion with Workplace Health and Safety officers, produced and implemented a system to reduce the risk of any recurrence of the incident. The Stop Use Order was lifted and Albian Sands Energy Inc. was requested to carry out a full investigation and report into the circumstances of the incident.

8.1.3 Bucyrus Canada Ltd. was requested to provide information to Workplace Health and Safety Compliance officers in connection with their investigation.

8.1.4 Fort McKay Group of Companies was requested to provide information to Workplace Health and Safety Compliance officers in connection with their investigation.

8.2 Industry

8.2.1 Albian Sands Energy Inc. constructed traffic islands at the southeast side of the crusher pad. Heavy haulers leaving the pad were given an instruction to pass around the traffic islands when leaving the pad. This prevented heavy haul trucks from cutting the corner at the intersection with the ramp. At the same time, Albian Sands Energy Inc. implemented a system requiring drivers of light vehicles to use an alternate route to and from the mine, avoiding the crusher pad. Albian Sands Energy Inc. surveyed the entire mine site and installed similar traffic islands at other intersections in the mine. (Attachment "C", Photographs #10, #11)

8.2.2 Albian Sands Energy Inc. carried out an investigation and produced a report into the circumstances of the incident. The report was reviewed and discussed with Workplace Health and Safety Compliance. Thirteen Action Items were identified, including the measures already taken. The site radio system was initially improved by providing additional channels, and will be completely upgraded. Signs were ordered to be installed at intersections requiring light vehicles to stop at a safe distance from the intersections. Maintenance and standby/staging areas were set up outside of the active mine area to limit the requirement for light vehicles to enter the active mine area. Additional reflective decals, identification numbers and light bars were fitted to light vehicles that entered the active mine area. The Mine Safe Work Practice program was completely reviewed. Collision avoidance technology that may be fitted to heavy haulers was evaluated.

8.2.3 Bucyrus Canada Ltd. provided the information requested by Workplace Health and Safety Compliance.

8.2.4 Fort McKay Group of Companies provided the information requested by Workplace Health and Safety Compliance.

8.3 Additional Measures

8.3.1 Albian Sands Energy Inc. issued an industry-wide alert describing the incident and the measures taken to prevent a recurrence.

SECTION 9.0 SIGNATURES

*Original Report Signed*_____ _____
Lead Investigator Date

*Original Report Signed*_____ _____
Investigator Date

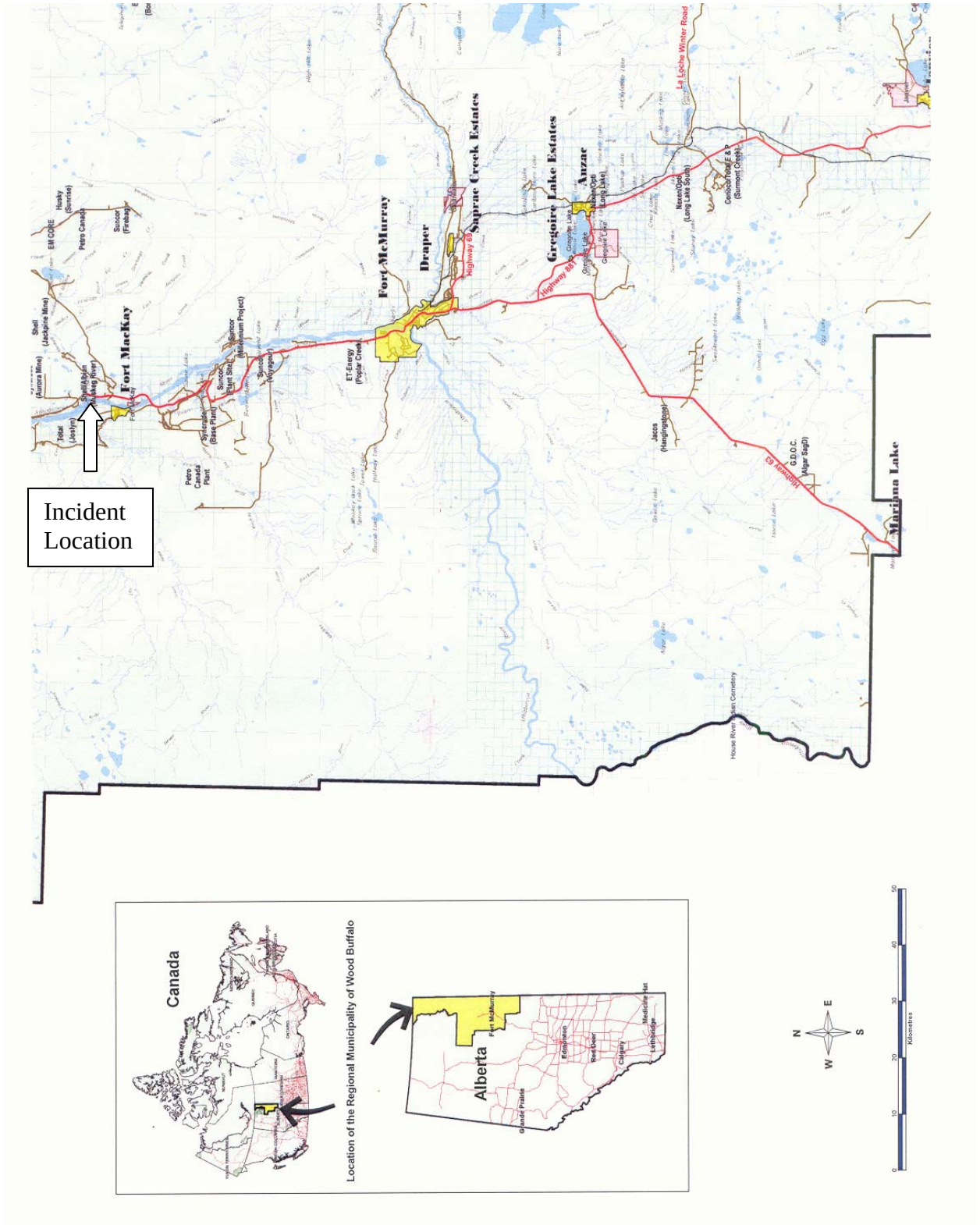
*Original Report Signed*_____ _____
Manager Date

*Original Report Signed*_____ _____
Regional Senior Manager Date

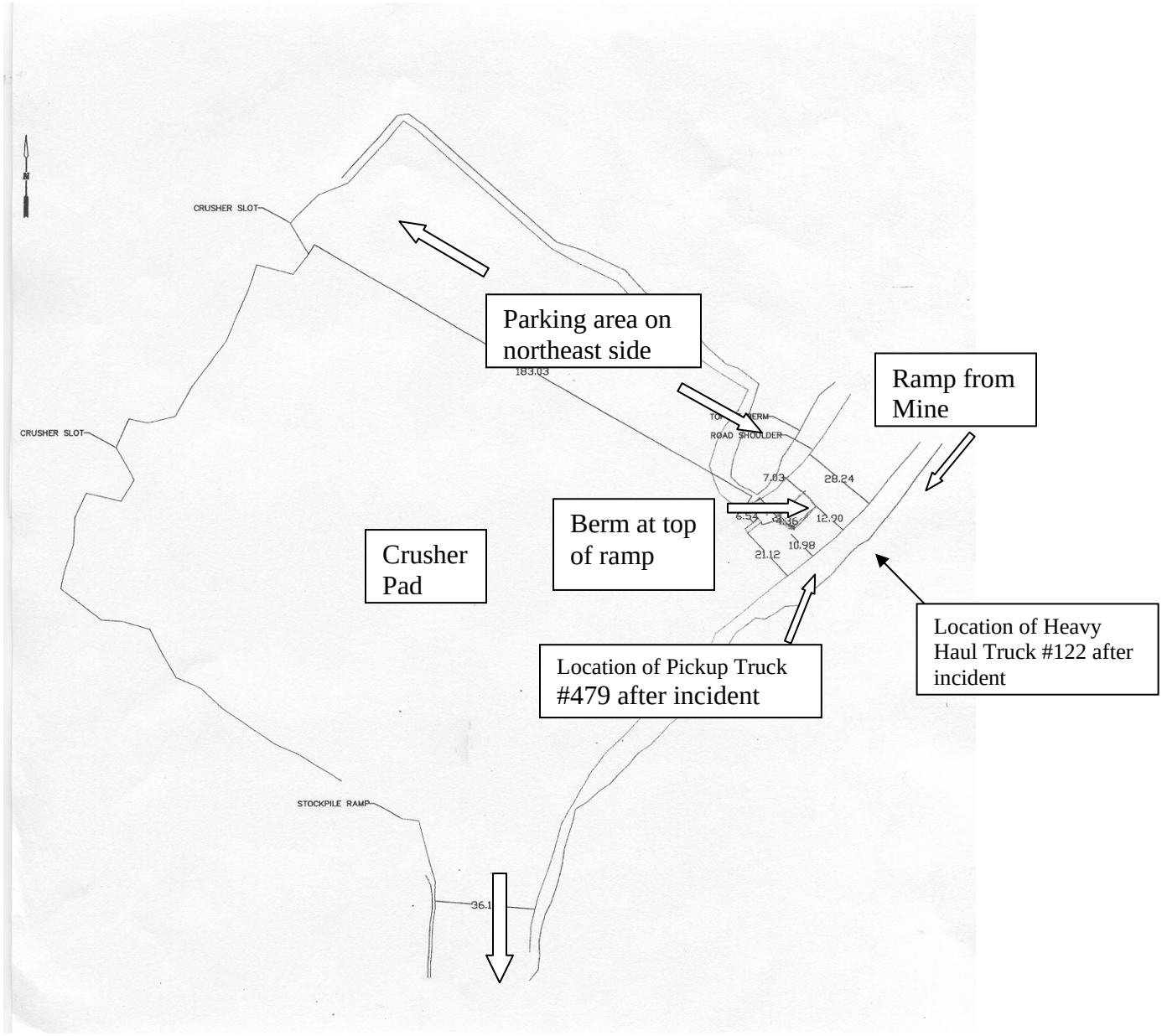
SECTION 10.0 ATTACHMENTS:

Attachment A Map
Attachment B Sketch
Attachment C Photographs

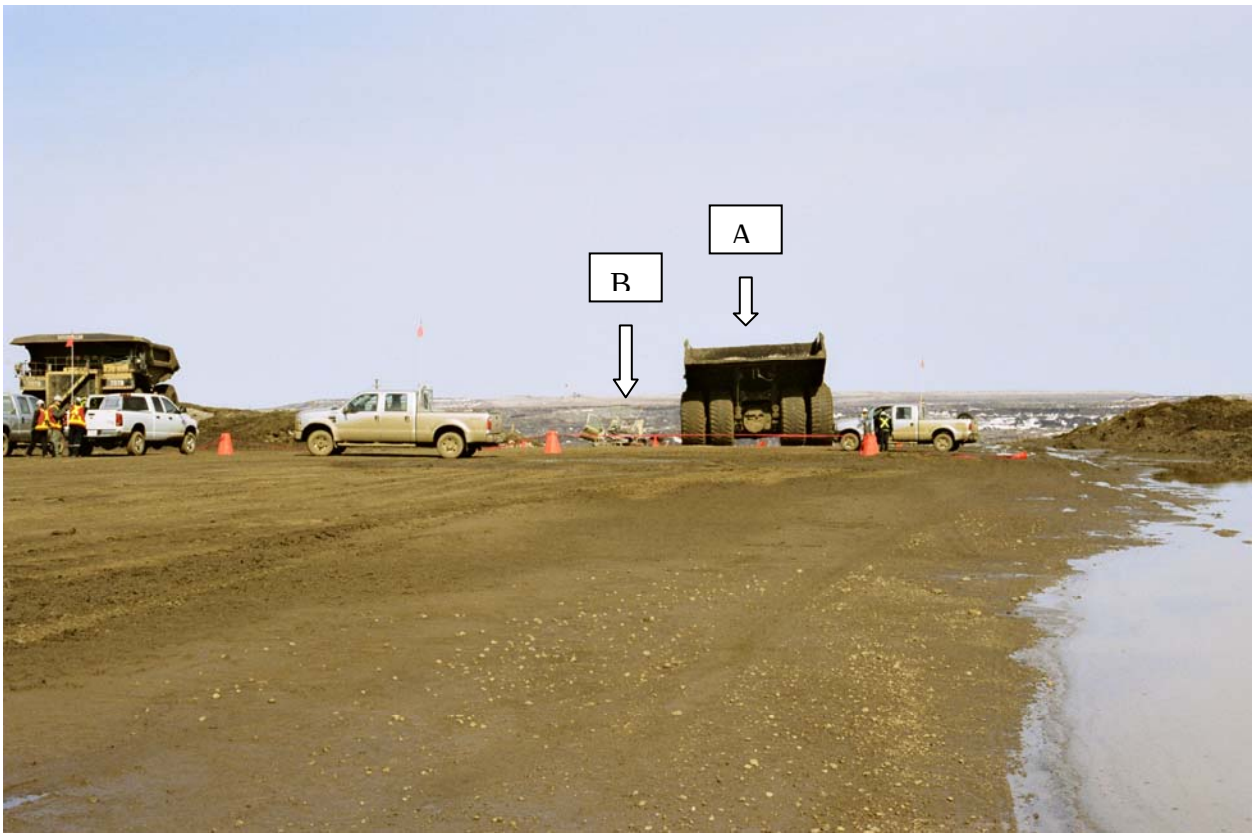
Report File No. F-067224
Attachment “A” - Map


Incident Location
Fort McMurray
Draper
Saprae Creek Estates
Gregoire Lake Estates
Anzac
Fort MacKay
Marjana Lake
Highway 63
Highway 881
Highway 69
Shell (Jackpine Mine)
Husky (Sunrise)
EM CORE
Petro Canada
Suncor (Firebag)
Total (Joslyn)
Shell/Albian (Muskeg River)
Suncor (Base Plant)
Suncor (Millennium Project)
Suncor (Voyageur)
Syncrude (Base Plant)
Petro Canada Plant
ET-Energy (Poplar Creek)
Jacos (Hangingstone)
G.D.O.C. (Algar Sagd)
Nexen/Opti (Long Lake South)
Canada
Alberta
Location of the Regional Municipality of Wood Buffalo
N
E
S
W
Kilometres
0
10
20
30
40
50

Survey drawing of Crusher Pad
Dimensions shown are in Meters.



Road to Processing Area



Photograph #1 Looking northeast across the Crusher Pad to the incident scene. Arrow “A” shows the heavy haul truck. Arrow “B” shows the pickup truck.

Photograph #2	Shows heavy haul trucks and other equipment parked on the northeast side of the Crusher Pad.

Photograph #3	Looking east. Shows the pickup truck and heavy haul truck where it stopped after the incident.

Photograph #4	Looking northeast. Shows the heavy haul truck and the pickup truck. The roof of the pickup truck was cut and lifted by emergency services to remove the Electrician from the pickup truck.

Photograph #5	Looking north. Shows the driver’s side of the pickup truck.

Photograph #6 Looking southeast. Shows the passenger side of the pickup truck.

Photograph # 7	Shows marks on the front driver’s side tire of the heavy haul truck.

Photograph #8 Shows a reconstruction carried out to assess the sight lines from an identical heavy haul truck. At this point the pickup truck starts to disappear from the view of the heavy haul truck operator.

Photograph #9 Shows the reconstruction. At this point the pickup truck is not visible to the heavy haul truck operator.

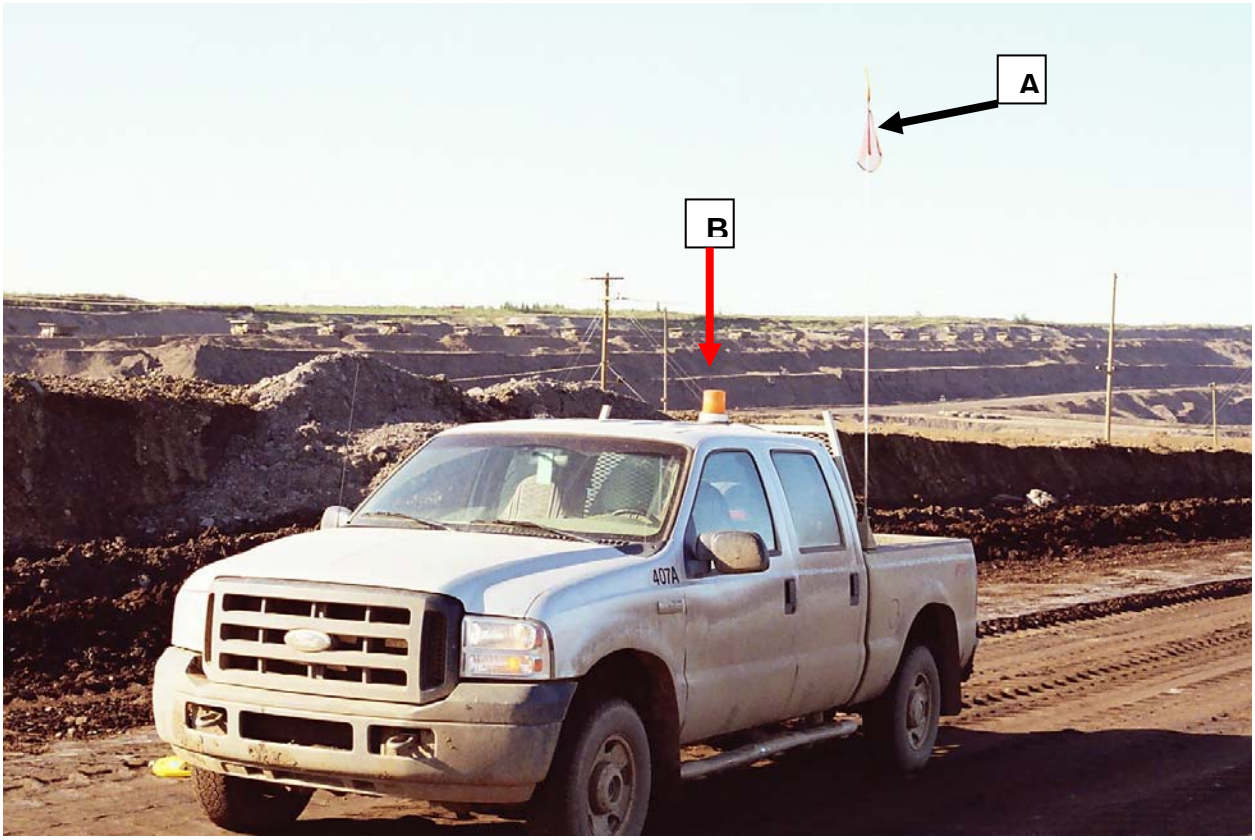
Photograph #10	Shows the traffic island, constructed from heavy haul truck tires, installed on the crusher pad after the incident.

Photograph #11	Shows a heavy haul truck descending the ramp from the Crusher Pad after passing around the traffic island.

Photograph #12	Reconstruction shows the view that a pickup truck driver has at the bottom of the ramp. A heavy haul truck parked on the Crusher Pad can be seen before the pickup truck starts to ascend the ramp. Arrow shows that a heavy hauler parked on the northeast side of the crusher pad is clearly visible.

Photograph #13	Reconstruction shows the view of a pickup truck driver ascending the ramp. The heavy haul truck parked on the crusher pad can be seen by the pickup truck driver.

Photograph #14	Reconstruction shows the view of a pickup truck driver stopped at the berm at the entry to the crusher pad. The berm obscures the view of the Crusher Pad and the heavy hauler cannot be seen by the pickup truck driver.



Photograph #15	Shows a pickup truck similar to the one involved in the incident. Arrow “A” shows the buggy whip and flag. Arrow “B” shows the flashing amber light fitted to the cab roof.

Photograph #16	Shows a heavy haul truck identical to the heavy haul truck involved in the incident. The officer standing at the front of the vehicle gives an indication of the size of the heavy haul truck.