

**WORKER STRUCK BY PIPE**

Type of Incident: Fatality

Date of Incident: February 2, 2012

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**SECTION 1.0 DATE AND TIME OF INCIDENT**

1.1 The fatality occurred on February 2, 2012 at approximately 8:45 a.m.

**SECTION 2.0 NAME AND ADDRESS OF PRINCIPAL PARTIES**

**2.1 Owner**

2.1.1 Celtic Exploration Ltd.  
Suite 500  
505 - 6<sup>th</sup> Avenue SW  
Calgary, Alberta  
T2P 3E6

**2.2 Contractor**

2.2.1 Celtic Exploration Ltd.  
Suite 500  
505 - 6th Avenue SW  
Calgary, Alberta  
T2P 3E6

**2.3 Employer/Worker**

2.3.1 Grizzly Falls Enterprises Ltd.  
Lead Operator (REDACTED)  
P.O. Box 1328  
Grande Cache, Alberta  
T0E 0Y0

**2.4 Other Employer(s)**

2.4.1 Tourmaline Oil Corp.  
3700, 250 – 6<sup>th</sup> Avenue S.W.  
Calgary, Alberta  
T2P 3H7

2.4.2 McNeil Construction Ltd.  
P.O. Box 538  
Grande Cache, Alberta  
T0E 0Y0

2.4.3 1484179 Alberta Ltd. O/A D&A Oilfield Services  
Box 1206  
Grande Cache, Alberta  
T0E 0Y0

## **SECTION 3.0 DESCRIPTION OF PRINCIPAL PARTIES**

### **3.1 Owner**

3.1.1 Celtic Exploration Ltd. is an upstream natural gas producer engaged in the exploration, acquisition, development, production and marketing of natural gas and crude oil in Canada; with reserves and producing properties throughout Alberta with their head office located in Calgary, Alberta. Celtic Exploration Ltd. took over the Copton gas well site (LSD: 11-21-59-8M W6) from ConocoPhillips Canada Resources Corporation on December 8, 2011, at which time Celtic Exploration Ltd. retained Grizzly Falls Enterprises Ltd. to act as a Celtic Exploration Ltd. representative and oversee the task of operating the Copton gas plant and the associated well sites in the Grande Cache area.

### **3.2 Contractor**

3.2.1 Celtic Exploration Ltd. retains several independent contract operators to oversee the production operations in the Grande Cache area which is referred to as the Copton gas field. Grizzly Falls Enterprises Ltd. and 1484179 Alberta Ltd. were independent contract operators who were retained by Celtic Exploration Ltd. to act as company representatives and provide operating services for both the Copton well sites and the Copton gas plant. Celtic Exploration Ltd. also retained McNeil Construction Ltd. to provide road maintenance services and Panda Tank and Vac Trucking Services Inc. to provide trucking services.

### **3.3 Employer**

3.3.1 Grizzly Falls Enterprises Ltd. was owned and operated by the Lead Operator (██████████) and contracted by Celtic Exploration Ltd. to provide production operating services of the wells and facility owned and operated by Celtic Exploration Ltd. in the Grande Cache Area.

### **3.4 Workers**

3.4.1 Lead Operator (██████████), owner of Grizzly Falls Enterprises Ltd, had worked for ConocoPhillips Canada Resources Corporation (previous owner) operating the wells and facilities in the Copton area prior to being contracted to Celtic Exploration Ltd. on November 30, 2011.

3.4.2 Contract Operator (██████████) owner of 1484179 Alberta Ltd. O/A D&A Oilfield Services was contracted to Celtic Exploration Ltd. since 2011. He was one of two operators working that field with the Lead Operator (██████████). On the Contract Operator's (██████████) days off, he contracted to McNeil Construction Ltd. as an Equipment Operator (██████████).

### **3.5 Other Employer(s)**

3.5.1 Tourmaline Oil Corporation is an upstream natural gas producer with their head office located in Calgary, Alberta. Tourmaline Oil Corporation was the well licence holder and owner for the 11-21-59-8W 6M wellsite location. Through an operating agreement Celtic Exploration Ltd. operates the site for Tourmaline Oil Corporation and accesses their pipeline riser located on the Tourmaline Oil Corporation location.

- 3.5.2 McNeil Construction Ltd. was contracted by Celtic Exploration Ltd. to do back hoe work on the road into well site LSD: 6-29-59-8W 6M. McNeil Construction Ltd. is a road building and maintenance construction company located in Grande Cache, Alberta. McNeil Construction Ltd. sub-contracted the road work they were hired to do by Celtic Exploration Ltd. to 1484179 Alberta Ltd. operating as D&A Oilfield Services.
- 3.5.3 D&A Oilfield Services (1484179 Alberta Ltd), was an independent contract operator contracted to both Celtic Exploration Ltd. as an operator (from December 11, 2011 to February 1, 2012) and to McNeil Construction Ltd. as an equipment operator/back hoe operator (February 2, 2012). Prior to Celtic Exploration Ltd. taking over the Copton Gas Well area on December 8, 2011, D&A Oilfield Services (1484179 Alberta Ltd) was an independent contract operator contracted to ConocoPhillips Canada Resources Corporation.

#### **SECTION 4.0 LOCATION OF INCIDENT**

- 4.1 The location of the incident was approximately 40 km North of Grande Cache, Alberta at LSD 11-21-59-8M W6. (Attachment A – Map 1)

#### **SECTION 5.0 EQUIPMENT, MATERIAL AND OBSERVATIONS**

##### **5.1 Equipment and Material**

###### **5.1.1 Worksite**

- 5.1.1.1 The Copton Gas Plant Site (11-25-59-9W 6M) is located approximately 25 km up the Sheep Creek Road located 40 km north of Grande Cache on Hwy 40. Numerous gas well sites, including the incident site (LSD: 11-21-59-8W 6M) feed into the main Copton Gas Plant site. (Attachment B – Map 2)

- 5.1.1.2 The Tourmaline Oil Corporation holds the licence of occupation for wellsite LSD 11-21-59-8W 6M, but Celtic Exploration Ltd. is responsible for operating the wellhead at LSD 11-21-59-08W 6M, which includes the Celtic Exploration Ltd. riser and pig receiver from the 9-27 and sender to 15-17 header system.

- 5.1.1.3 The Celtic Exploration Ltd. Copton pipeline is approximately 17 km long with several gas wells feeding into it. The production in this line is sent to the Celtic Exploration Ltd. Copton gas plant for processing. The maximum operating pressure of this line was 9930 kPa although normal operating pressure for this line ranged from 700 to 900 kPa. (Attachment B - Map 2)

###### **5.1.2 The Celtic Exploration Ltd. 273 mm Pig Sender and 168.3 mm Pig Receiver**

- 5.1.2.1 The incident location, 11-21-59-8W 6M, consists of a 273.0 mm pig sender for launching 219.1 mm pigs to the 15-17-59-8W 6M location and a 168.3 mm pig receiver for catching 114.3 mm pigs coming from the 09-27-59-8W 6M. (Attachment C, Photograph # 1)
- 5.1.2.2 The pipeline pig (pig) is a solid cylindrical or spherical shaped tool that is introduced into the line via a pig trap, which includes a launcher. The pig is then forced through the line by product flow, sweeping the line by scraping the sides of the pipeline and pushing debris ahead and arriving in a pig receiver.

5.1.2.3 Pig senders (launchers) and pig receivers are installed on pipelines to launch and receive pipeline pigs, pipeline spheres and pipeline inspection tools. This is done without stopping the flow of the product in the pipeline. These operations include but are not limited to cleaning and inspecting the pipelines. This is accomplished by inserting the pig into a pig launcher. The launcher is then closed and the pressure-driven flow of the product in the pipeline is used to push it along down the pipe until it reaches the receiving trap (pig catcher).

### **5.1.3 Blow Down Pipe Assembly**

5.1.3.1 When the isolated receiver is depressurized the blow down pipe assembly was used to redirect any fluids or gas contained within the receiver.

5.1.3.2 The blow down pipe assembly (304.8 mm long) attached to the pipe line at the 11-21- 59-8W 6M consisted of two 90 degree elbows, two short pipe nipples threaded at both ends, one iron coupling, and one long pipe threaded at both ends. (Attachment C, Photograph# 2) The blow down pipe assembly was screwed to the open threaded pipe nipple of the 33.4 mm ball valve located near the end cap of the pig receiver prior to the incident. (Attachment C, Photograph# 3) The blow down pipe assembly was not part of the engineered design of the piping system at the 11-21 59-8W 6M, which was designed for an operating pressure of 9930 kPa.

### **5.1.4 The 33.4 mm Ball Valve Assembly**

5.1.4.1 A ball valve is a ball placed in a passageway through which fluid or pressure flows. The ball has a hole through it, by which the valve opens and closes. When the ball is positioned so that the hole runs the same direction as the passageway the fluid or pressure flows through the hole and the valve is open. When the ball is positioned so that the hole is perpendicular to the passageway, the fluid cannot pass through, and the valve is closed. The ball is controlled from outside the valve, often with a handle that is turned 90 degrees, or a quarter turn, back and forth to open and close the valve. (Attachment C, Photograph# 4)

5.1.4.2 A 33.4 mm ball valve with pipe nipples on both ends (identification markings 1RB 16.34, B136-CS3-43-S2, 3000 MOP, 08/04) was attached to the pipe assembly, located near the end cap of the pig receiver.

### **5.1.5 Two Pressure gauges**

5.1.5.1 Two Wika brand pressure gauges, with a 114.3 mm face and male stainless steel connection, were connected to the 11-21-59-8M W6 section of the pipe assembly that was shut in. The two pressure gauges were mounted to a needle valve that included a close nipple on the opposite side. Each pressure gauge had a range of 0 to 20,600 kPa. The one pressure gauge, closest to the pig receiver, was used to read the pressure in the receiver. The other pressure gauge was used to measure the pressure up stream of the receiver. (Attachment C, Photograph# 5)

### **5.1.6 SCADA (Supervisory control and Data Acquisition)**

5.1.6.1 SCADA (supervisory control and data acquisition) is a type of industrial control system (ICS). It consists of software programs and hardware components used for process control and the gathering of data in real time from various locations and distances in order to gather information and control equipment and conditions. SCADA is commonly used in the oil and gas industry. SCADA also records and logs all events into a file stored on a hard disk or sends them to a printer. SCADA warns when conditions become hazardous by sounding alarms.

### **5.2 Observation**

5.2.1 On February 2, 2012, when the Occupational Health and Safety Investigators arrived on scene it was noted that the site had been secured by Celtic Exploration Ltd. after Grande Cache RCMP had left the scene.

5.2.2 When Occupational Health and Safety Investigators entered the incident site the Lead Operator's ( ) truck was parked on the North side of the Copton 11-21-59-8M W6 well site, facing West with the driver's door open. (Attachment C, Photograph# 1)

5.2.3 The Occupational Health and Safety Investigators observed that the pipe line to the 11-21-59-8 W6 header was shut in and the pressure gauge, attached to the pipeline assembly near the end cap of the pig receiver, indicated a line pressure of 0 kPa. The pipeline pressure upstream of the receiver was observed to have a pressure of 4700 kPa. This pressure was seen over the entire length of the pipeline. (Attachment C, Photograph# 5)

5.2.4 Occupational Health and Safety retained a professional engineer from Anderson Associates Consulting Engineers Inc. to assist in the Occupational Health and Safety investigation and to provide a report.

## **SECTION 6.0 NARRATIVE DESCRIPTION OF THE INCIDENT**

6.1 On December 8, 2011, Celtic Exploration Ltd. acquired the ConocoPhillips Canada Resources Corporation well sites and associated gas plant in the Copton production area near Grande Cache. At the time of the incident Celtic Exploration Ltd. was in the process of switching from ConocoPhillips Canada Resources Corporation policies and procedures to Celtic Exploration Ltd. policies and procedures for the operation of the Copton well sites and associated facility.

6.2 Sometime before February 2, 2012, the Contract Operator ( ) built the blow down pipe assembly with the Lead Operator ( ) and attached it to the pipe assembly on the 11-21-59-8W 6M pig receiver to redirect any fluids or gas contained within the receiver.

6.3 February 1, 2012, the Contract Operator ( ) was the operator pigging the lines (as per the Celtic Exploration Ltd. pigging schedule), which runs to the 11-21 riser. During this pigging process, the 15-17 riser to the 11-25 plant was closed in and never reopened, resulting in the increase pressure buildup in the entire field.

- 6.4 February 2, 2012, at approximately 7:30 a.m. the Lead Operator ( ) met with the Water Truck Driver ( ) and the Contract Operator ( ), who was on days off from Celtic Exploration Ltd. working for McNeil Construction Ltd. as a backhoe operator. The Lead Operator ( ) instructed the Water Truck Operator ( ) to go up to the gas plant to get a load of produced water and to use the 2 way radio to tell him when he was finished. The Lead Operator ( ) told the Water Truck Operator ( ) that he was going to Grande Cache Coal and would be back to meet up with him later.
- 6.5 The Backhoe Operator ( ) and the Lead Operator ( ) had a brief discussion about the operations of the field and what work needed to be done on the road. The Lead Operator ( ) had retained McNeil Construction Ltd. to provide road maintenance work in the Copton area.
- 6.6 Between 7:30 a.m. and 8:40 a.m. the Lead Operator ( ) drove his truck into the 11-21-59-8W 6M wellsite. There was a pig that was scheduled to be in the receiver at 11-21-59-8W 6M that was sent from the 8-35-59-8W 6M on February 1, 2012, and needed to be taken out.
- 6.7 The Lead Operator ( ) started to open the 33.4 cm ball valve to depressurize the pig receiver. When the valve was opened to approximately 20% the blow down pipe, attached to the 33.4 cm ball valve, spun off and struck the Lead Operator ( ) in the head. The Lead Operator ( ) fell back onto the ground with a fatal head injury.
- 6.8 At approximately 08:40 a.m. the Water Truck Operator ( ) finished loading the produced water at the Copton Gas Plant and attempted to radio the Lead Operator ( ). When the Lead Operator ( ) did not respond, the Water Truck Operator ( ) left the gas plant and started to head back down the Sheep Creek road.
- 6.9 When the Water Truck Operator ( ) arrived at the km 13 security gate on the Sheep Creek road, he radioed the Backhoe Operator ( ) and informed him that he still could not reach the Lead Operator ( ). The Backhoe Operator ( ) told the Water Truck Operator ( ) that at approximately 8:30 a.m. he heard the Lead Operator ( ) on the radio entering into the well site 11-21-59-8M W6. The Backhoe Operator ( ) told the Water Truck Operator ( ) that he would come down to the 11-21-59-8M W6 site.
- 6.10 At approximately 09:20 a.m. the Backhoe Operator ( ) arrived at the km 13 security gate and drove towards the 11-21-59-8M W6 wellsite. He radioed to the Water Truck Operator ( ) that he only saw fresh tire tracks going into the site and there were none coming out.



- 6.11 On February 2, 2013 at approximately 09:30 a.m. the Backhoe Operator ( ) arrived at the wellsite and he radioed to the Water Truck Operator ( ) that he saw the Lead Operator's ( ) truck parked on the North side of the well site, facing West, with the driver's truck door open. The Backhoe Operator ( ) stopped his backhoe and got out. As the Backhoe Operator ( ) was walking up to the well site, he saw the Lead Operator ( ) laying face up on the snow, approximately 30 cm away from the 11-21-59-8M W6 pig receiver. (Attachment C, Photograph #6)
- 6.12 The Backhoe Operator ( ) approached the Lead Operator ( ) on the ground and checked for vitals. The Backhoe Operator ( ) then radioed to the Water Truck Operator ( ) that there was a Man Down, and to call the RCMP and Ambulance and summons for help.
- 6.13 The Water Truck Operator ( ) did not have cell services so, through a series of two-way radio transmissions, 911 was contacted.
- 6.14 At approximately 09:50 a.m. the Backhoe Operator ( ) went over to the Lead Operator's ( ) truck, which was still running, and pushed either the "Emergency" or "Help" button on the Lead Operator's ( ) Satellite Personal Locator (SPOT), which was sitting on the dash of the Lead Operator's ( ) truck.
- 6.15 The Grande Cache Emergency Medical Services and RCMP ( ) arrived at the scene at approximately 11:30 a.m. The Lead Operator ( ) was pronounced dead at the scene.

## **SECTION 7.0 FOLLOW-UP/ACTION TAKEN**

### **7.1 Industry**

- 7.1.1 Celtic Exploration Ltd. conducted an investigation into the circumstances surrounding the incident.
- 7.1.2 Celtic Exploration Ltd. identified and implemented several corrective actions to prevent recurrence.
- 7.1.3 February 8, 2012 Celtic Exploration Ltd. released a Safety Alert directly related to the incident to all senior management and production/operations group.
- 7.1.4 All piping and associated components at the 11-21-59-8W 6M site have been redesigned and stamped by an engineer to meet the standards and built in accordance with CSA Z662-11.
- 7.1.5 Celtic Exploration Ltd. has completed site specific pigging procedures for all pigging locations and systems for the Copton area.
- 7.1.6 Celtic Exploration Ltd. developed start up procedures, including a hazard assessment prior to starting up the 11-21-59-8W 6M location and associated wells and piping.

- 7.1.7 Celtic has contracted instrumentation and maintenance companies to identify and correct any deficiencies including all ESD's and respected settings for the Copton area.
- 7.1.8 Skills Track System has been implemented to track all Celtic employees training Certificates and notify of expiries.
- 7.1.9 The SCADA system is fully functional and operational after the transition period from ConocoPhillips Canada Resources Corp. to Celtic Exploration Ltd.

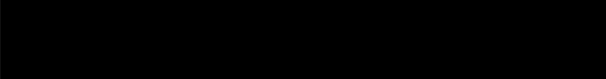
**7.2 Additional Measures**

7.2.1 There were no other additional measures.


**SECTION 8.0 SIGNATURES**

  
 Corinne Goodenough, Lead Investigator


  
 Date

  
 Adele Tait, Investigator

  
 Date

  
 Susanne Kachur, Manager

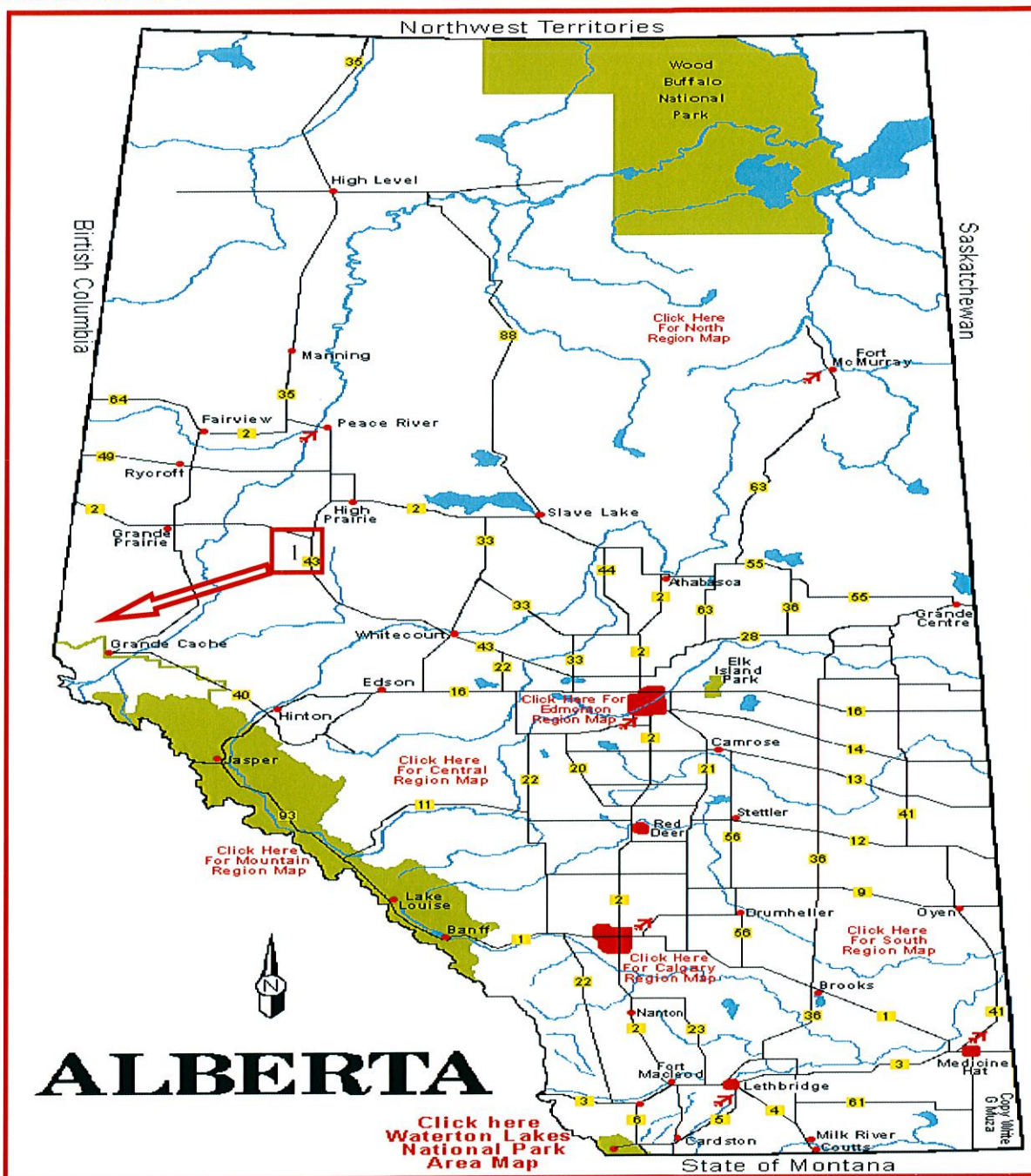
  
 Date

  
 Chris Powell, Regional Director Lead Investigators

  
 Date

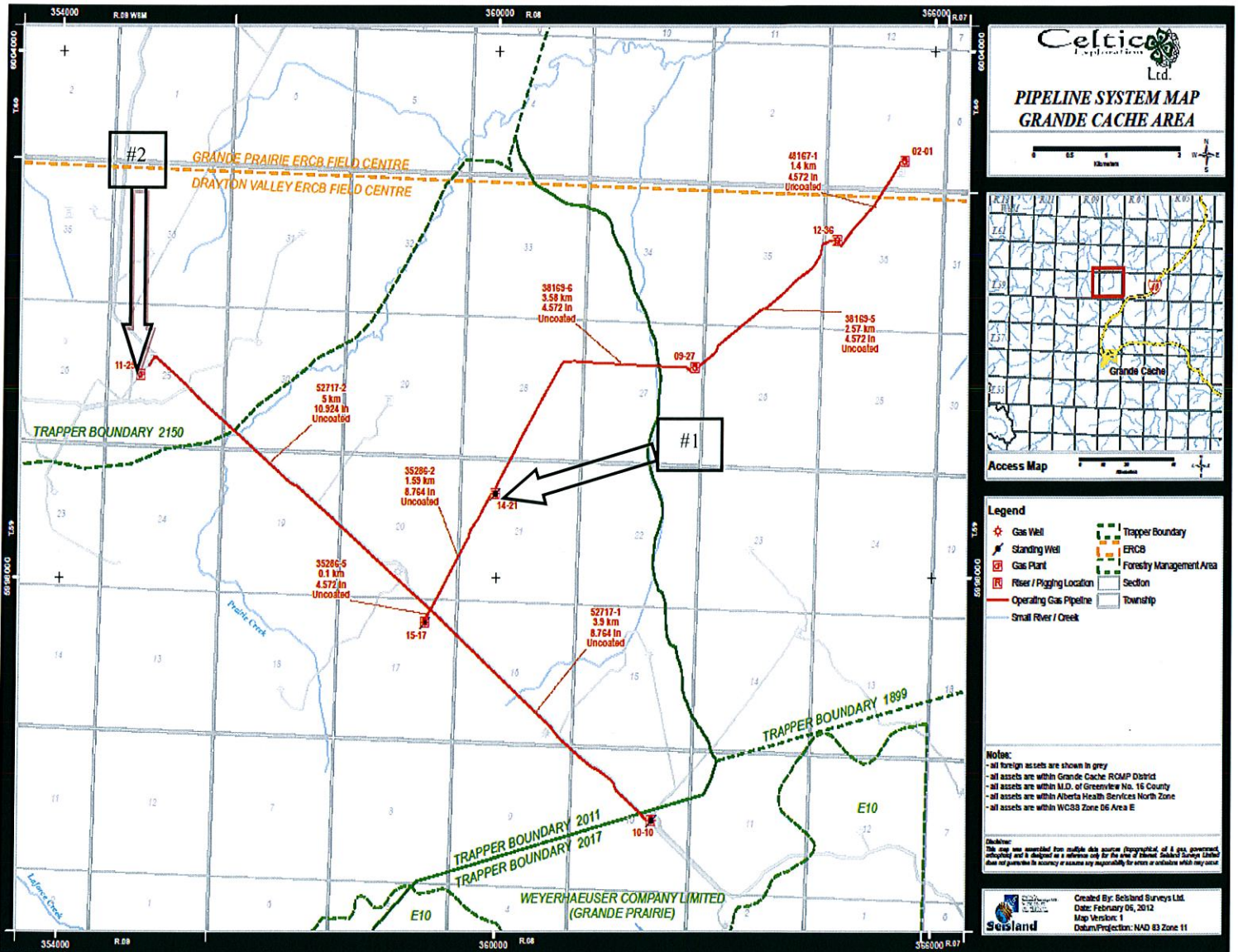
**SECTION 9.0 ATTACHMENTS:**

- Attachment A Map
- Attachment B Diagrams or Sketch - Not Applicable
- Attachment C Photographs



Map #1

1. The arrow shows the approximate location of LSD 11-21-59-8W 6M approximately 40 km northwest of Grande Cache, Alberta



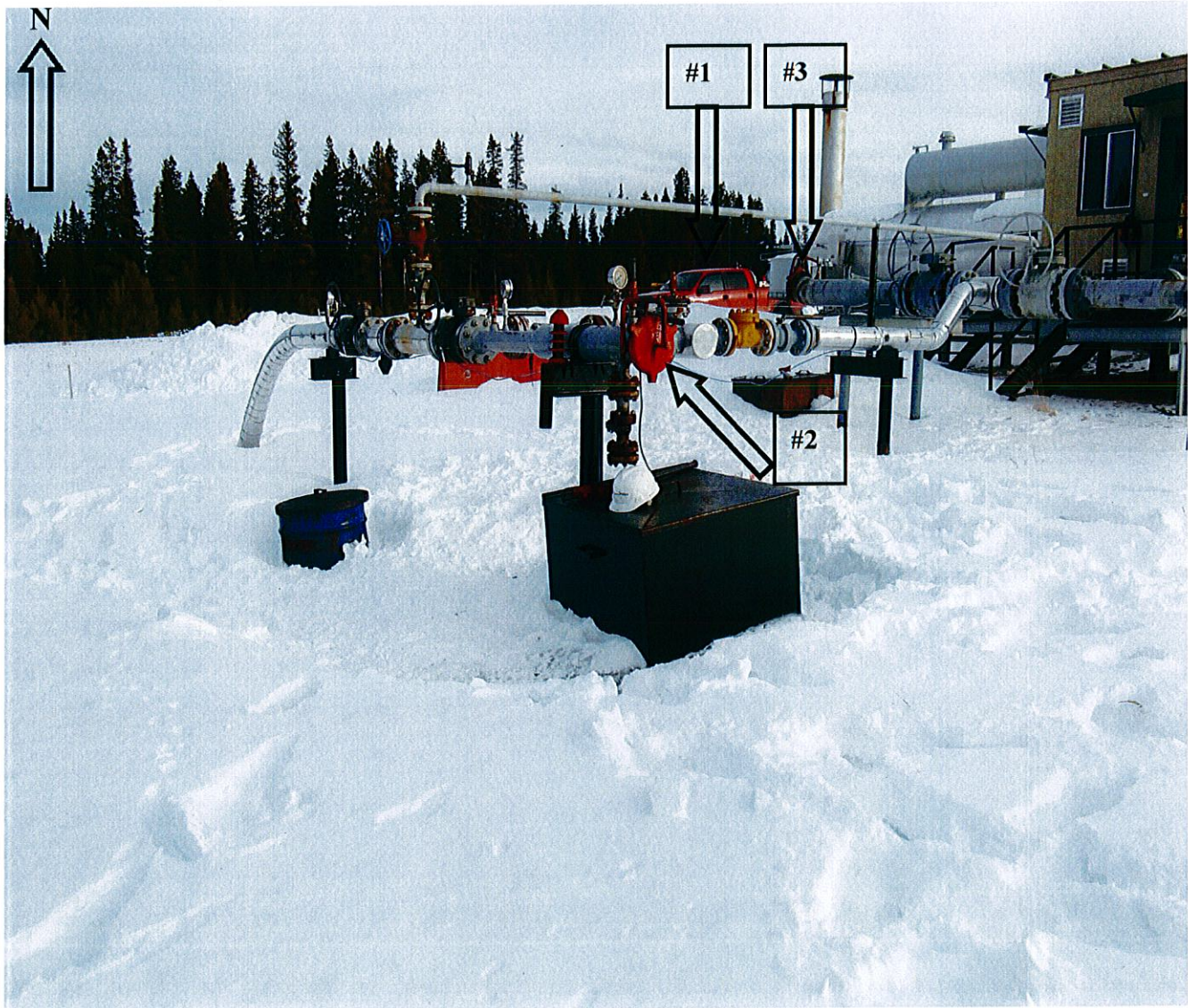
**Map # 2**

#1. The arrow shows the location of the incident site 11-21-59-8W 6M.  
 #2. The arrow shows the location of the Copton field main plant.  
 The red lines indicate the pipeline systems in the Copton field, operated by Celtic Exploration Ltd.



**Photograph #1**

This photograph shows the Copton well location sign at the well site entrance to the 11-21-59-8W 6M.



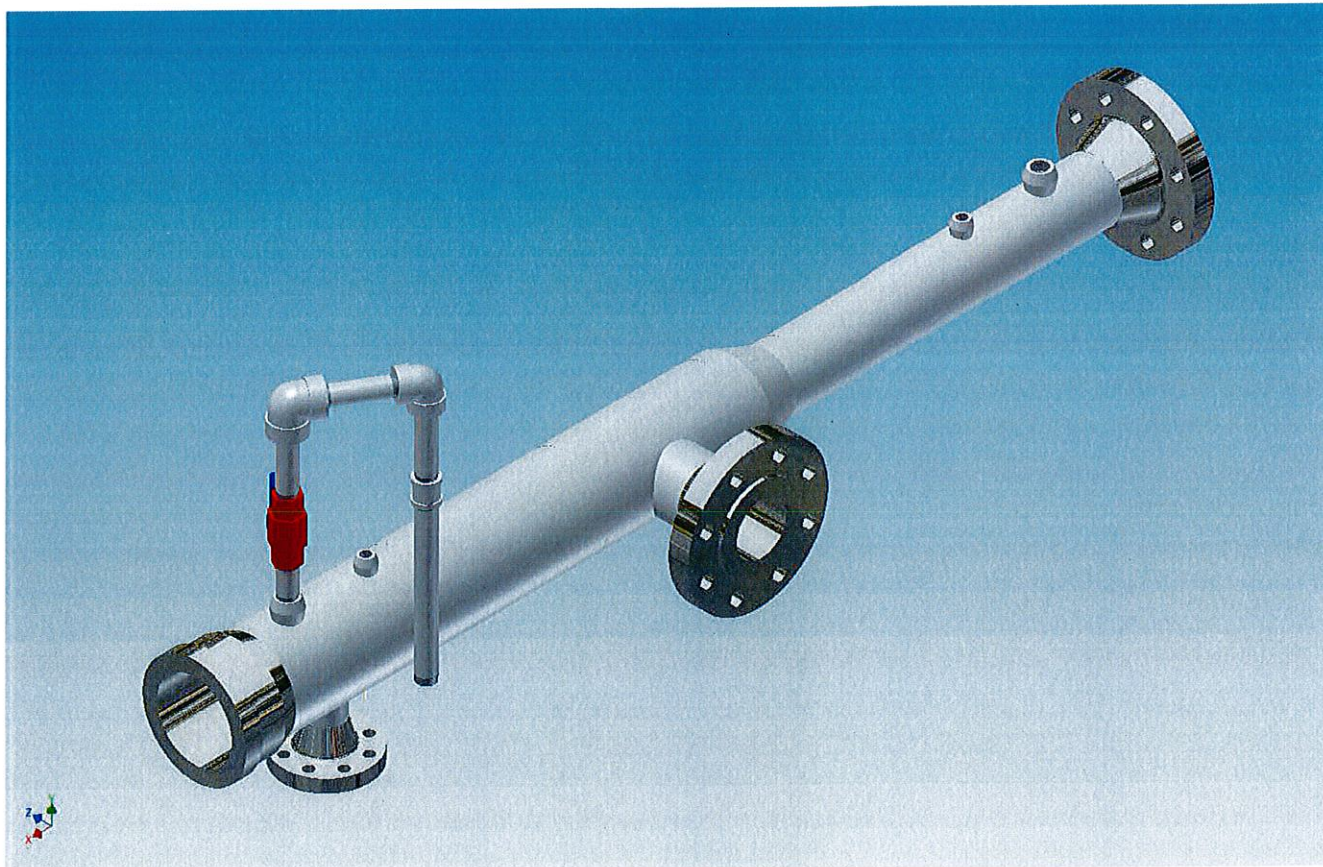
**Photograph #2**

- #1. Shows location of the Lead Operators (Gordon Cinnamon) truck.
- #2. Shows the pig receiver at the 11-21-59-8W 6M, which receives pigs sent from the 9-27 well site.
- #3.. Shows the pig sender at the 11-21-59-8W 6M, which launches the pig to the 15-17-59-8W 6M receiver.



**Photograph #3**

The blow down pipe assembly that was attached to the ball valve. (see Photograph# 3)



**Photograph #4**

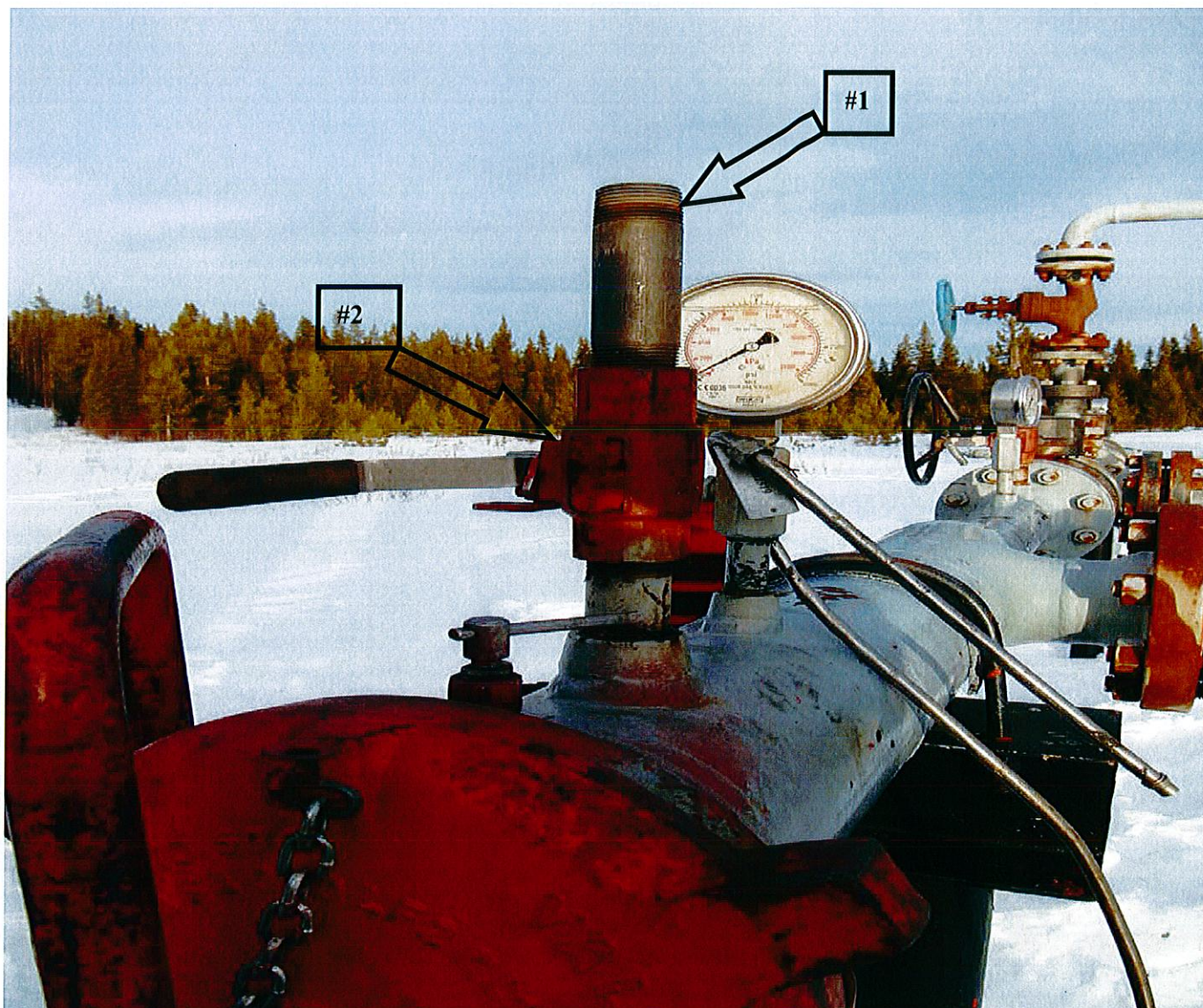
This is a 3D model of the pig receiver at the 14-21-59-8W 6M site showing how the threaded pipe assembly may have been attached prior to the incident. This 3D model was completed by Anderson Associates Consulting Engineers Inc.





**Photograph #5**

- #1. The pressure gauges near the pig receiver.
- #2. The valve in the closed position, which blocks and traps the pressure to the pig receiver.
- #3. The pressure gauge and pressure reading in the line (4800 kPa).



**Photograph #6**

- #1. Where the blow down pipe assembly was attached.
- #2. Ball valve assembly.



**Photograph #7**

- #1. Shows the location the lead operator was found.
- #2. Shows the location where the blow down pipe was found.