

**Tanker Truck Fire**

**Date of Incident: August 14, 2001**

**Type of Incident: Fatal**

**TABLE OF CONTENTS****PAGE NUMBER**

<b>SECTION 1.0</b>	<b>DATE AND TIME OF INCIDENT</b>	<b>1</b>
<b>SECTION 2.0</b>	<b>NAME &amp; ADDRESS OF PRINCIPAL STAKEHOLDER(S)</b> <b>- Owner(s)</b> <b>- Prime Contractor</b> <b>- Employer(s)</b>	<b>1</b>
<b>SECTION 3.0</b>	<b>DESCRIPTION OF PRINCIPAL STAKEHOLDER(S)</b>	<b>1</b>
<b>SECTION 4.0</b>	<b>LOCATION OF INCIDENT</b>	<b>2</b>
<b>SECTION 5.0</b>	<b>EQUIPMENT &amp; MATERIAL INVOLVED</b>	<b>2</b>
<b>SECTION 6.0</b>	<b>NARRATIVE DESCRIPTION OF INCIDENT</b>	<b>3</b>
<b>SECTION 7.0</b>	<b>ANALYSIS</b>	<b>3</b>
<b>SECTION 8.0</b>	<b>APPLICABLE LEGISLATION</b>	<b>4</b>
<b>SECTION 9.0</b>	<b>FOLLOW-UP/ACTION TAKEN</b>	<b>4</b>
<b>SECTION 10.0</b>	<b>SIGNATURES</b>	<b>5</b>
<b>SECTION 11.0</b>	<b>ATTACHMENTS</b>	<b>5</b>

**Section 1.0 DATE AND TIME OF INCIDENT**

1.1 August 14, 2001, 3:45 p.m.

**Section 2.0 NAME & ADDRESS OF PRINCIPAL STAKEHOLDER(S)**

**2.1 Owner(s)**

2.1.1 Gibson Petroleum Company Ltd.  
1700, 440-2<sup>nd</sup> Avenue S.W.  
Calgary, Alberta  
T2P 5E9

**2.2 Prime Contractor**

2.2.1 Gibson Petroleum Company Ltd.  
1700, 440-2<sup>nd</sup> Avenue S.W.  
Calgary, Alberta  
T2P 5E9

**2.3 Employer(s)**

2.3.1 Jim Goodwin Trucking Ltd.  
P.O. Box 127  
Amisk, Alberta  
T0B 0B0

**Section 3.0 DESCRIPTION OF PRINCIPAL STAKEHOLDER(S)**

**3.1 Owner/Prime Contractor**

3.1.1 Gibson Petroleum Company Ltd. sells natural gas condensate to various industries located in Western Canada. The company operates a bulk fuel terminal located in Hardisty, Alberta.

**3.2 Employer**

3.2.1 Jim Goodwin Trucking Ltd. was an owner-operated trucking company contracted by Gibson Petroleum Company Ltd. to deliver natural gas condensate to customers in Western Canada.

#### **Section 4.0 LOCATION OF INCIDENT**

- 4.1 The incident occurred at the Gibson Petroleum Hardisty Terminal located six kilometres east of Hardisty, Alberta (LSD 4-29-42-9 W4). The exact location of the incident was at the loading station of bulk fuel tank #5 (Refer to Attachment A, Diagram #1, #2, and #3).

#### **Section 5.0 EQUIPMENT AND MATERIAL INVOLVED**

- 5.1 The Gibson Petroleum Hardisty Terminal had 14 above ground bulk fuel storage tanks of various capacities. Storage tank #5 had a capacity of 11,285,000 litres and was used to supply natural gas condensate to the loading station at the time of the incident (Refer to Attachment A, Diagrams #1, #2, and #3).
- 5.2 The loading station was located south of tank #5 and consisted of a loading riser and a piping system. The loading riser was equipped with a ball valve and a 76-millimetre flex hose connection (Refer to Attachment B, Photograph #1).
- 5.3 The vehicle involved in the incident was a diesel fuelled 2000 Kenworth truck and was equipped with a Roper, Model 3648 pump. Two storage tank trailers were attached to the truck. The capacities of the storage tank trailers were 35,000 and 28,500 litres and were empty at the time of the incident (Refer to Attachment B, Photographs #2, and #3).
- 5.4 The Roper, Model 3648 pump was connected to the loading riser with a 76-millimetre flex hose. The loading pump was driven by the truck's power take-off. The piping system on the storage tank trailers had a series of valves to control the flow of natural gas condensate during the loading process (Refer to Attachment B, Photographs #4, and #5).
- 5.5 The truck driver had extensive experience in loading/unloading of flammable natural gas condensate. He loaded condensate from the Gibson Petroleum Hardisty Terminal many times prior to this incident. The truck driver had formal training in the Transportation of Dangerous Goods Act, Worksite Hazardous Material Information System and Hydrogen Sulfide. The truck driver was wearing flame retardant clothing.

## **Section 6.0 NARRATIVE DESCRIPTION OF INCIDENT**

- 6.1 On August 14, 2001 at approximately 3:40 p.m. a truck driver entered the Gibson Petroleum Hardisty Terminal to obtain a load of natural gas condensate. The truck driver parked his truck at the loading station.
- 6.2 The truck driver used a flex hose to connect the loading riser to the loading pump on the truck. The truck driver opened the valve on the loading riser allowing natural gas condensate to flow through the flex hose. The truck driver then walked around the front of the truck. He was at the passenger door of the truck when the flex hose burst.
- 6.3 Witnesses observed a large plume of natural gas condensate spewing into the air. At approximately 3:45 p.m. the truck's engine began to accelerate and the natural gas condensate plume ignited. Two explosions occurred. Fire engulfed the truck cab and severely damaged the front compartment of the 35,000-litre storage tank trailer.
- 6.4 The truck driver was severely burned in the fire. The on-site emergency response team called 911. A certified Emergency Medical Responder administered first aid to the truck driver until Emergency Medical Services arrived.
- 6.5 The truck driver was transported to a health care centre in Hardisty. STARS air ambulance then transported the truck driver to a hospital in Edmonton. On August 20, 2001 the truck driver died in hospital.

## **Section 7.0 ANALYSIS**

### **7.1 The Direct Cause:**

- 7.1.1 Over pressure burst the flex hose and released flammable natural gas condensate into the air. The released flammable natural gas condensate ignited with an ignition source from the truck engine compartment.

### **7.2 Contributing Factors:**

- 7.2.1 Discharge valves in the loading piping system were closed, which did not allow the condensate to flow and created over pressure in the flex hose.
- 7.2.2 The loading pump on the truck was a positive displacement model pump, which continually built pressure in the flex hose.

**Section 8.0 APPLICABLE LEGISLATION**

- 8.1 General Safety Regulation 448/83, Section 14, subsection 3. In this section “where an employer develops a code of practice or other procedures or measures pursuant to this Regulation, they shall ensure that all workers who are to be affected by the code, procedures or measures are made familiar with them before they commence the work process involving them.”

**Section 9.0 FOLLOW-UP/ACTION TAKEN**

**9.1 Industry**

- 9.1.1 The prime contractor voluntarily stopped work at the natural gas condensate loading station and conducted an investigation. The investigation report was submitted to Workplace Health and Safety.
- 9.1.2 The prime contractor upgraded and enforced new safe work procedures for the unloading and loading of natural gas condensate. Truck drivers were trained in the new safe work procedures.
- 9.1.3 The prime contractor introduced engineering safeguards requiring remote activation of loading risers at the natural gas condensate loading station.
- 9.1.4 The prime contractor complied with all Workplace Health and Safety orders.

**9.2 Alberta Human Resources and Employment**

- 9.2.1 Workplace Health and Safety responded to the scene on August 14, 2001 and commenced an incident investigation.
- 9.2.2 Orders were issued requiring the prime contractor to conduct an incident investigation and implement corrective measures to prevent recurrence. The prime contractor was ordered to implement safe work procedures for the unloading and loading of natural gas condensate.
- 9.2.3 A sample of the natural gas condensate was collected from the trailer tanks for laboratory analysis.
- 9.2.4 Workplace Health and Safety retained the services of an engineering company to prepare a report on the truck’s loading pump and associated equipment.

**9.3 Additional Measures**

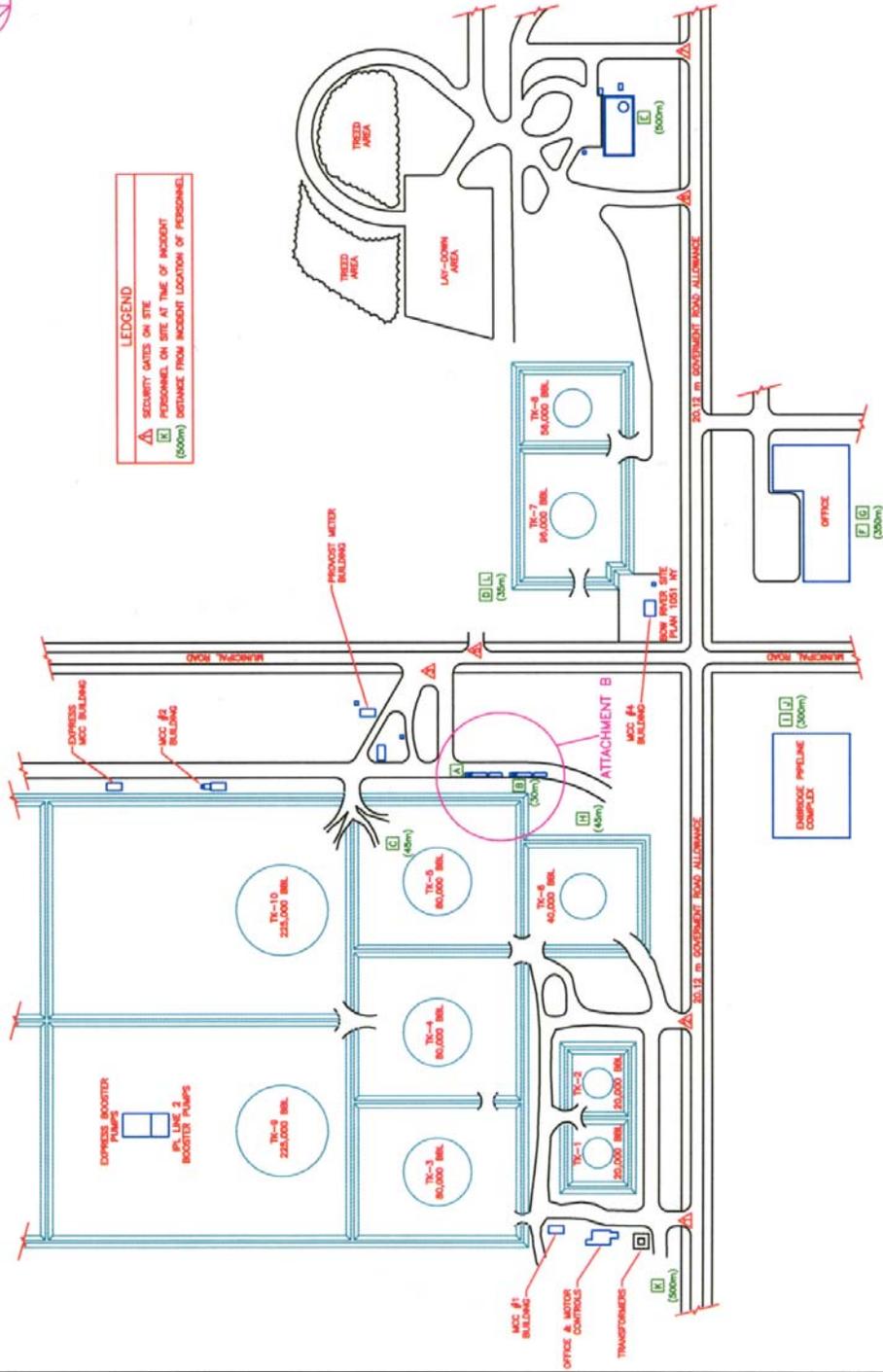
- 9.3.1 Workplace Health and Safety will meet with the prime contractor to review the consulting engineer's report regarding the installation of pressure relief valves on positive displacement pumps.

**Section 10.0 SIGNATURES**

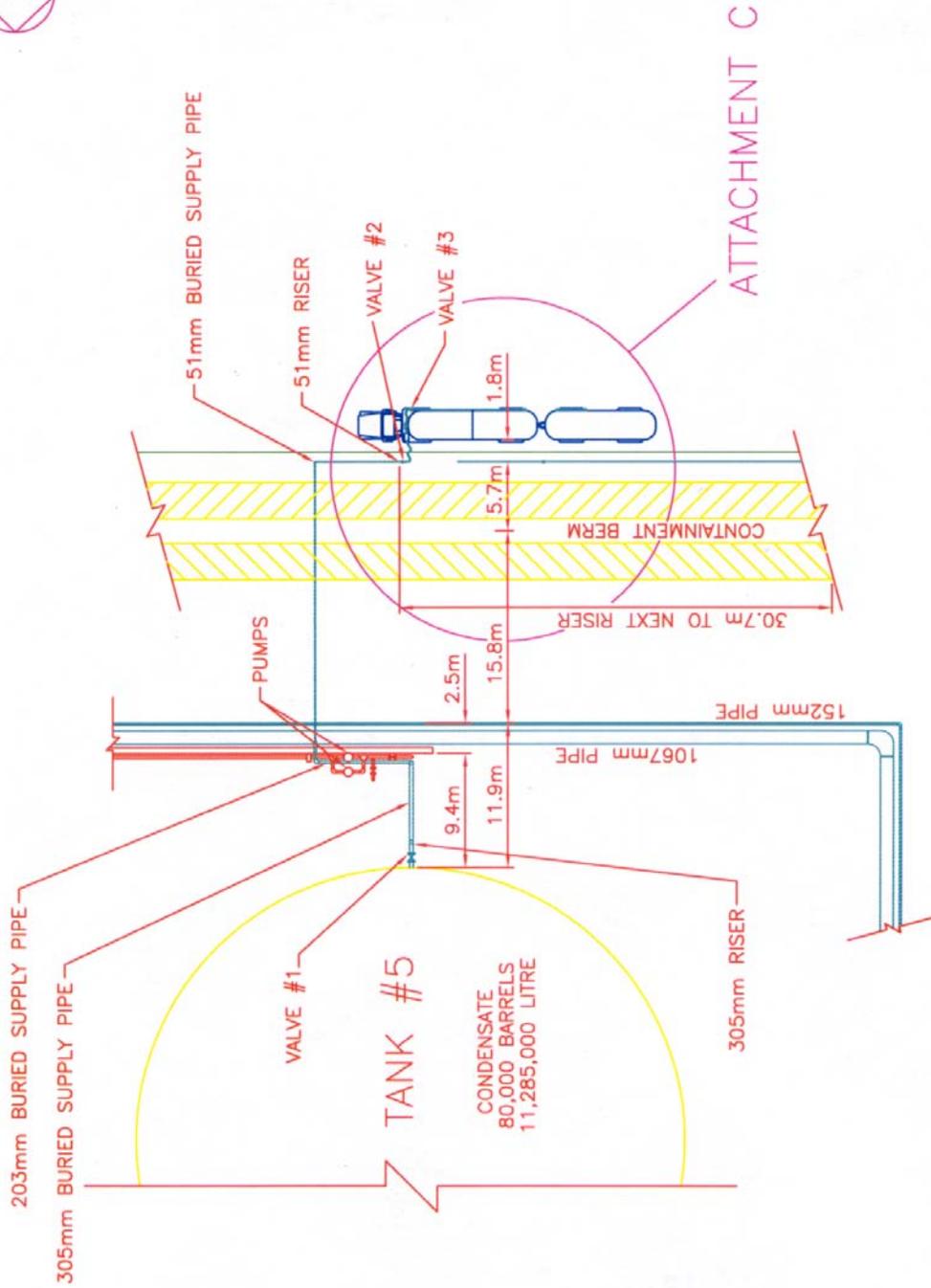
*Original report signed*

**Section 11.0 ATTACHMENTS**

- Attachment A - Diagrams
- Attachment B - Photographs



FILE NO: F123456      ATTACHMENT: A      NAME: GIBSON PETROLEUM      SCALE: NTS      DATE: 01-09-27



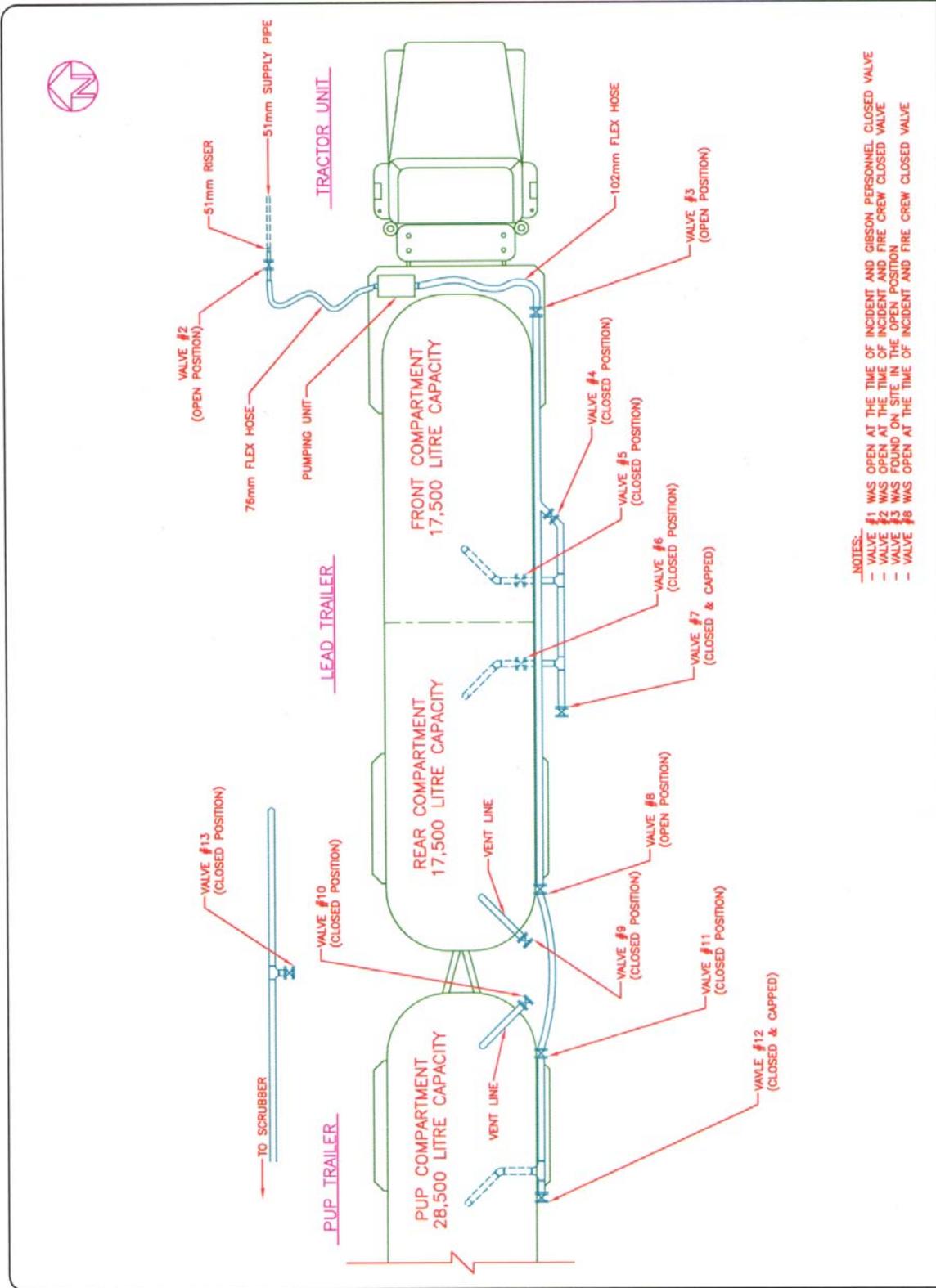
FILE NO: F123456

ATTACHMENT: B

NAME: GIBSON PETROLEUM

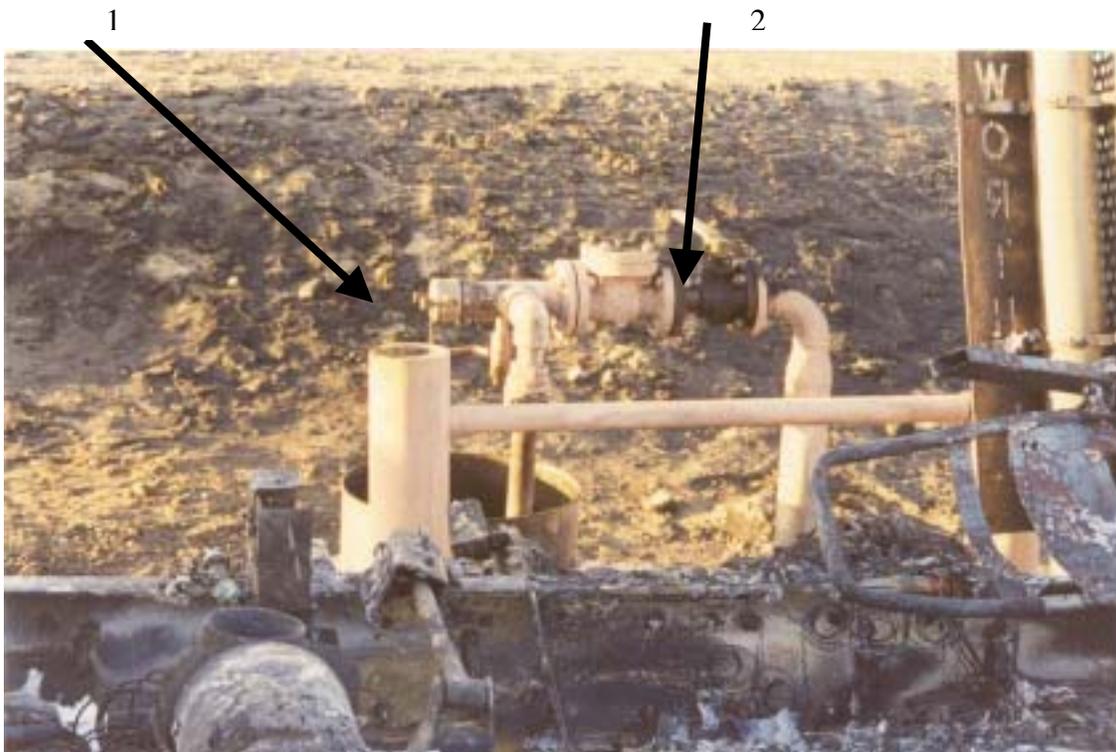
SCALE: NTS

DATE: 01-09-27



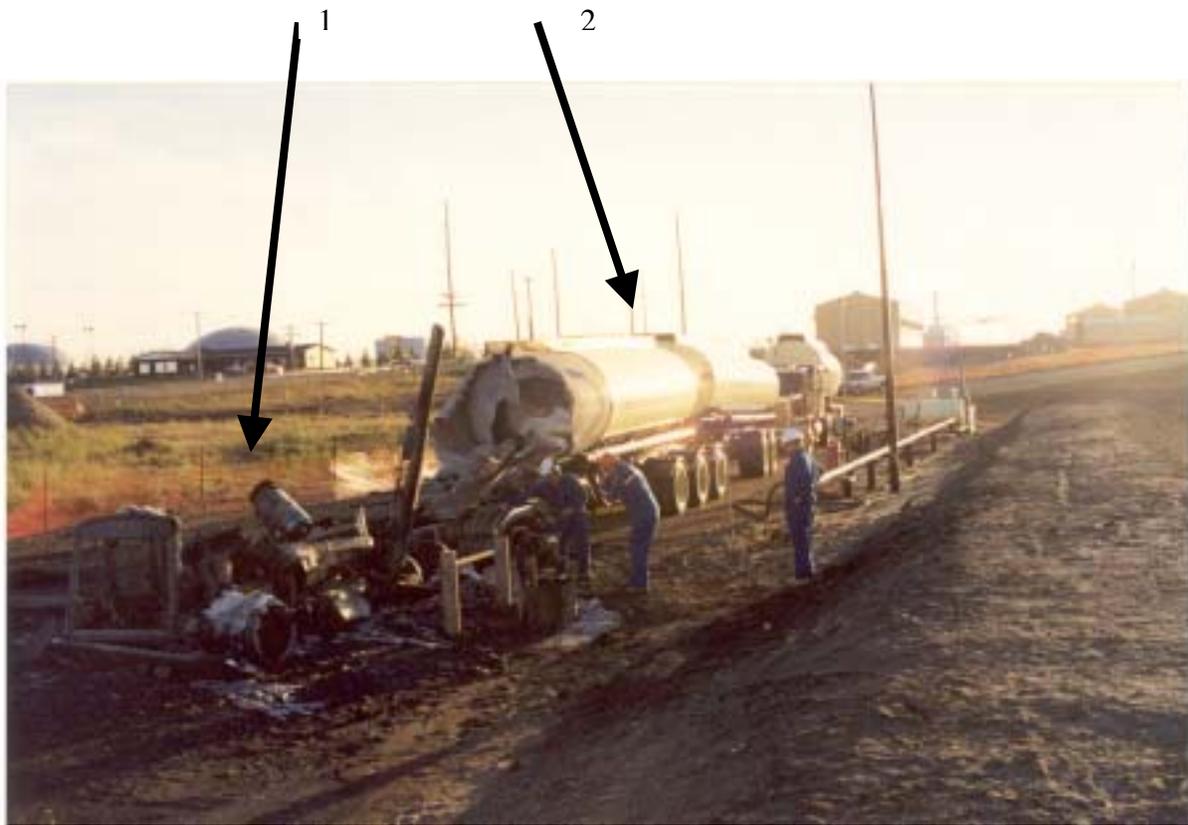
- NOTES:
- VALVE #1 WAS OPEN AT THE TIME OF INCIDENT AND GIBSON PERSONNEL CLOSED VALVE
  - VALVE #2 WAS OPEN AT THE TIME OF INCIDENT AND FIRE CREW CLOSED VALVE
  - VALVE #3 WAS FOUND ON SITE IN THE OPEN POSITION
  - VALVE #8 WAS OPEN AT THE TIME OF INCIDENT AND FIRE CREW CLOSED VALVE

FILE NO: F123456	ATTACHMENT: C	NAME: GIBSON PETROLEUM	SCALE: NTS	DATE: 01-09-27
------------------	---------------	------------------------	------------	----------------



**Photograph 1:** Shows the loading riser.

1. Shows where the truck driver attached the flex hose to the loading riser.
2. Shows the loading riser equipped with a ball valve.



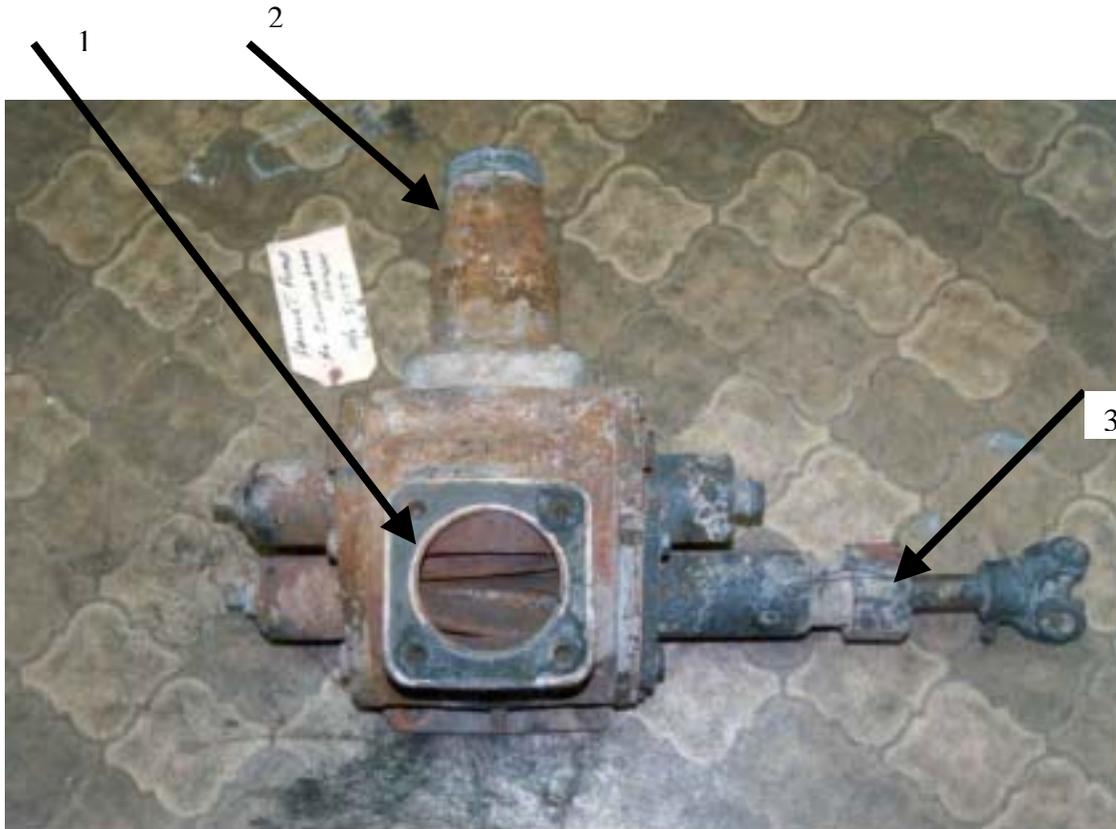
**Photograph 2:** Shows the damaged truck and loading tank trailers.

1. Shows the burned 2000 Kenworth truck.
2. Shows the two storage tank trailers attached to the truck: a 35,000-litre capacity lead tank and a 28,500-litre capacity rear tank.



**Photograph 3:**

1. Shows the flex hose attachment point on the loading riser.
2. Shows the remains of the burned flex hose.
3. Shows the intake connection of the loading pump.



**Photograph 4:** Shows the Roper, Model 3648 pump that was mounted on the truck.

1. Shows the pump's discharge outlet.
2. Shows the pump's inlet connection.
- 3 Shows the drive shaft of the pump that was attached to the truck's engine power take-off.



**Photograph 5:** Shows a typical loading arrangement.

1. Shows a loading riser and control valve.
2. Shows the loading riser connected to the pump on a truck with a flex hose.