

Investigation Report
Worker Drowned After Falling Into a Water Tank
September 25, 2012

The contents of this report

This document reports Occupational Health and Safety's investigation of a worker who drowned after falling through a hole in the floor at a water treatment plant under construction in September 2012. It begins with a short summary of what happened. The rest of the report covers this same information in greater detail.

Incident summary

On September 25, 2012, a worker was in the process of removing a sonotube formwork from a concrete pump base in the High Lift Pump Station at the Fort McMurray Water Treatment Plant. While in the process of removing the formwork, the worker fell through the hole in the pump base, landed in the water reservoir below, and subsequently drowned. The worker was discovered on the morning of September 26, 2012 in the water reservoir.

Background information

Regional Municipality of Wood Buffalo

The Regional Municipality of Wood Buffalo (RMWB) is located in the northeastern part of the province of Alberta. The RMWB covers almost 70 000 square kilometres and is one of the largest municipalities in North America. The RMWB consists of 12 communities, with Fort McMurray being the urban service centre of the municipality. The water treatment plant is owned by the RMWB to supply potable water to Fort McMurray. The water treatment plant was undergoing a major expansion at the time of the incident, and the RMWB contracted Bird Construction Company to conduct work at the water treatment plant.

Bird Construction Company

Bird Construction Company is a construction company that started as a small general contractor in the 1920's in Moose Jaw, Saskatchewan and has grown to a large national general contracting company providing construction services in both Canada and the United States. Bird Construction Company has offices located throughout Canada with its corporate office located in Mississauga, Ontario.

Bird Construction Company was contracted by the RMWB to conduct the following work at the water treatment plant:

- Construction of a new pretreatment building, filter building and filtered water transfer station to be added to the existing plant.
- Construction of a new on-site storage structure, high lift pumping and caustic storage building.
- Construction of a new operations building adjacent to the filtered water transfer station building.

Workers

Labourer 1 was employed by Bird Construction Company as a labourer and was hired on August 17, 2012. At the time of the incident, labourer 1 had been working for Bird Construction Company for a little over 1 month.

Labourer 2 was employed by Bird Construction Company for 1.5 years.

Labourer 3 was employed by Bird Construction Company for 2 months.

General Foreman was employed by Bird Construction Company for 6 years.

Millwright 1 was employed by Pic Industrial Equipment Ltd for 4 years.

Millwright 2 was employed by Pic Industrial Equipment Ltd for 8 days.

Carpenter Supervisor was employed by Bird Construction Company for 6 years.

Labourer 4 was employed by Bird Construction Company.

Labourer 5 was employed by Bird Construction Company for 4.5 years.

Lockerbie & Hole Superintendent was employed by Lockerbie & Hole for 17 years.

Carpenter Foreman was employed by Bird Construction for 6 years.

Worksite

The incident occurred at the Fort McMurray water treatment plant at #1 Silin Forest Road, Fort McMurray, Alberta.

Water Treatment Plant

The water treatment plant was undergoing a major expansion at the time of the incident to increase the supply of potable water for the city of Fort McMurray's growing population and to address more stringent regulatory requirements.

High Lift Pump Station

The High Lift Pump Station's (HLPS) purpose was to pump potable water from the concrete reservoir to the residents in the northern portions of the city of Fort McMurray (Figure 1). The HLPS included bases for seven pumps that were located over a concrete reservoir. At the time of the incident, a hydrostatic test was in progress to test the integrity of the concrete reservoir below the building. The hydrostatic test was started approximately ten days before the incident, and consisted of approximately seven days to fill the tank and approximately three days of visual leak detection.



Figure 1 – High Lift Pump Station (HLPS)

Equipment and materials

Rotary Hammer

A rotary hammer was a rotary drill that provided a hammering action. The hammering action provided a short, rapid hammer thrust and with a bushing tool attached it could pulverize relatively brittle material to add texture to a surface (Figure 2). The textured surface was required for the bonding of grout to leveling plates.



Figure 2 – Rotary Hammer

A – Bushing tool

Sonotubes

Sonotubes were a round concrete form (tube) that was made from paper products (cardboard). Sonotubes were used as a mold for holding wet concrete in place until it hardened, for example creating a column (Figure 3). At the time of the incident, the sonotube was used to create a circular opening in a concrete pump base. The sonotube was approximately 76.2 centimetres (cm) in diameter and had approximately 16 two by fours 66 cm long, vertically arranged around

the inside circumference of the sonotube. They were further secured in place with a plywood top and bottom.

This arrangement provided the support for the sonotube to allow concrete to be poured around it so a hole would be formed in the centre of the pump base without the sonotube collapsing. The resulting hole in the pump base was for the pump shaft to fit through to access the water in the reservoir.



Figure 3 – Concrete pump base

A – Sono tube embedded in the concrete base

B – Plywood formwork (not yet removed)

Sequence of events

On the morning of September 25, 2012, labourer 1 and labourer 2 started work around 6:30 a.m. and were assigned work at the HLPS. At the HLPS, both workers filled out their Field Level Hazard Assessment (FLHA) cards. Labourer 2 helped direct labourer 1 what they needed to do.

Work consisted of scraping dried concrete from the pump bases and cleaning up afterwards. This continued until first coffee break at approximately 9:30 a.m. After the coffee break, the general foreman assigned labourer 1 the job of bush hammering the seven pump bases in the HLPS (Figure 4). The general foreman went with labourer 1 to go over what needed to be done. At this time, labourer 2 was assigned the job of taking out reglets down by the reservoir in the HLPS by the carpenter foreman.



Figure 4 – Inside of the HLPS where the pump bases were located.

A – Plywood cover over pump base worker fell through

Final Report

Approximately a half hour later, labourer 2 went to check on labourer 1. Labourer 2 found labourer 1 was doing okay as labourer 1 was almost done bush hammering the second pump base. Labourer 2 asked labourer 1 if they should trade jobs to give labourer 1 a break. Labourer 1 declined as labourer 1 did not want to change jobs. Labourer 2 swept up two piles of rubble created by the bush hammering and threw the rubble in a dumpster. Labourer 2 then went back to continue with the reglet job.

Labourer 2 last saw labourer 1 at approximately 11:00 a.m. Sometime that afternoon, the general foreman met labourer 1 outside of the HLPS and assigned labourer 1 the task of removing one of the sonotubes from a pump base. This request was originated by the Lockerbie & Hole superintendent. The general foreman did not go with labourer 1 to show labourer 1 what needed to be done but did give some verbal direction on the task.

At approximately 3:00 p.m., labourer 3 remembered seeing labourer 1 at last break in the afternoon at the lunch trailer.

Between 3:30 p.m. and 4:00 p.m., labourer 1 continued to work on the removal of the sonotube and fell through the hole in the pump base, landing in the water below in the reservoir, and subsequently drowned. As labourer 1 was working alone, there were no witnesses to these events.

Near the end of the shift, at approximately 4:00 p.m., labourer 2 went to check on labourer 1, and labourer 1 was nowhere to be seen. Millwright 1 and millwright 2 arrived at approximately 4:00 p.m. to install shims for the pump that was to be installed on the pump base that labourer 1 had last been seen to be working on. Labourer 2 went back downstairs to finish a previous job.

When the millwrights finished their work on the pump base, they covered the open hole in the pump base with a piece of plywood. They left the site at approximately 4:30 p.m.

September 26, 2012, at approximately 7:00 a.m., a worker went to the carpenter supervisor and explained that a truck had been left in the parking lot all night. Labourer 5 was sent to check the sign out sheet. Labourer 5 then told labourer 4 that labourer 1 had not signed out from the day before. The carpenter supervisor told labourer 5 to take the carpenter supervisor to where labourer 1 had been working the day before.

At the HLPS, it was noted that one of the pump bases was covered with a piece of plywood. The carpenter supervisor removed the plywood, looked down the hole, and yelled into the tank. There was no response. The carpenter supervisor borrowed a flashlight from a pipefitter in the area and when the hole was illuminated, the carpenter supervisor saw a hardhat floating in the water.

Final Report

The carpenter supervisor had the area ribboned off and called 911. When Emergency Medical Services and the fire department arrived, they used their floodlight and were able to see labourer 1 under the water. Labourer 1 was recovered from the tank and was pronounced dead at the scene.

Completion

A review for enforcement action was completed on February 5, 2013, and it was determined that the file would be referred to Alberta Justice for review. The entire file was sent to Alberta Justice on November 27, 2013, and charges were laid on September 22, 2014.

Bird Construction Company pled guilty to Section 139(1)(c) of the Occupational Health and Safety Code in which the employer failed to ensure that its worker used a fall protection system at a work area where a worker may fall into a hazardous substance or through an opening in the work surface.

On October 27, 2017, Bird Construction Company was fined \$300 000 plus 15 per cent Victim Fine Surcharge for a total fine of \$345 000.

This investigation was closed on December 18, 2017.

Final Report

Signatures

ORIGINAL REPORT SIGNED

May 9, 2018

Lead Investigator

Date

ORIGINAL REPORT SIGNED

May 9, 2018

Manager

Date

ORIGINAL REPORT SIGNED

May 9, 2018

Director

Date