



# Fatal Facts

May 2002  
Report # 47-2-02



Irrigation ditches, such as this, contain hidden dangers.

## Drowning dangers on agricultural lands

Acres of orchards, wheat, and vegetables conceal more drowning hazards than you may think. Irrigation systems pump, transport, and store large amounts of water to irrigate crops. Workers may be responsible for developing and maintaining these irrigation resources. Agricultural workers often have to be near sources of water that can present a risk of drowning if one is not careful. In recent years (1997-2000), 10 adult workers in Washington State drowned doing agriculture-related work. Children who live in agricultural areas or work on farms are also at especially high risk of drowning if water hazards are present. Here are a few important things to consider to prevent drownings.

*Know where hazards exist and know safe practices that help prevent drowning.*

### Where are drowning hazards?

There are a number of drowning hazards in agriculture. They include:

- Irrigation canals or ditches
- Farm ponds and cisterns
- Liquid manure and slurry storage pits, ponds, lagoons or tanks
- Water-filled well tailings pits
- Wells
- Lakes, reservoirs, rivers and streams

### How can drownings happen?

Information about drowning deaths in agriculture can help employers and workers understand how tragedy occurs and work to prevent future deaths. Several recent incidents are described below.

#### Irrigation canals

##### Scenario #1

Two farmworkers drowned in an irrigation canal. A 17-year-old orchard worker was working near an irrigation canal and fell into the canal or side chute of the main canal. The canal was on a moderate slope, made of concrete and was 3 feet wide with 2-1/2 foot vertical walls and had about a foot of fast moving water in it. He was swept down the chute into a pool with 16-inch high cement pillars whose purpose was to slow the speed of the water. A 31-year-old orchard worker tried to rescue him, they both drowned.

##### Scenario #2

An irrigation system ditchrider drowned in an irrigation canal. A 52-year-old employee of an irrigation project was removing boards that served as a gate from a culvert entrance along an irrigation canal. He somehow fell into the culvert and drowned.

**Scenario #3****Well Tailings Pits**

Two workers, a farmhand and mechanic, drowned in a water-filled well tailings pit. Workers drilling a well in a remote area of a farm created a pit about 100 feet long and 50 feet wide to catch the spoils from the bottom of the well. The pit was 8 to 10 feet deep with vertical sides and contained about 4 feet of water and a foot of foam caused by a foaming agent used in the well drilling process. A 71-year-old farmhand drilling the well did not return from the site, and a 39-year-old mechanic went to look for him. The bodies of both men were found in the tailings pit. Both victims had sunk into and became stuck in the mud at the bottom of the pit and drowned. The incident was unobserved but it is thought that the older worker was spraying defoamer on the foam and fell into the pit and was unable to get out. The younger employee found him there and entered the pit to rescue him and was also unable to break free from the pit.

**River**

A horse trainer was thrown from his horse and drowned in a river. A 49-year-old experienced horse trainer was giving a lesson in riding techniques to two people at a park along a river. He often taught horses and riders how to ride in water. He rode his horse into shallow water where the horse panicked and bolted into the river. The instructor was thrown off the horse and fell into deep water. He struggled in the 41-degree water but could not get to the shore. The county medical examiner ruled that he died as a result of “cold water drowning.”

**Canal siphon**

Four divers drowned in an irrigation canal siphon or tunnel. Two recreationally trained scuba divers entered a half-mile long, 104-foot deep, underground, water-filled tunnel to perform work for an irrigation district. When they did not return after an hour, two rescue divers were sent into the tunnel. After the rescue divers did not return, a third pair of divers was sent in to pull them out. They found the divers, three of whom were dead, the fourth died several days later. The divers who died were without a standby diver, a

tended line, communications, and surface supplied air.

**How can drowning be prevented?**

Working in agriculture presents a variety of water hazards. Here are some of the hazardous situations that may be found and a few simple things to do to prevent drowning.

**Irrigation canals or ditches**

Avoid entering irrigation canals or ditches because they present several potentially dangerous situations. If you must work around or near them, be aware of the following conditions that could prove hazardous.

- **Water that is quickly moving.** Fast-moving water in a narrow channel can knock a person off their feet. Even water only a foot deep, if it is moving fast enough, would cause you to lose your balance and be carried away.
- **Deep water.** If you cannot swim or if you are hurt, falling into deep water could prove fatal. In addition to swift currents, irrigation canals may have undertows and turbulence that could drag even a strong swimmer under water.
- **Steep slopes and slippery walls.** The concrete or earthen sides of ditches and canals are sometimes steep and possibly slippery, making them difficult to climb.
- **Grates, culverts, spillways, and in-water energy dissipation devices.** If one were to fall into a water-filled ditch or canal, additional hazards include becoming caught up in or striking an object or structure. This may cause someone to become submerged and/or lose consciousness.

*Between 1997 and 2000, ten workers in Washington State drowned while performing agriculture-related work.*

**Scenario #4****Scenario #5**

### **Dams**

Falling off or floating over a dam structure can cause injury. Low-head dams, sometimes no more than a couple feet high, on streams, rivers, and canals present a special danger. Under certain conditions they can create what is known as a “drowning machine”. The backwash below the dam traps anyone that falls into it and forces them down where they are re-circulated round and round, making escape difficult or impossible. Strong swimmers, people wearing life preservers, and even trained rescue personnel have drowned in these drowning machines.

### **Siphons (underground water filled tunnels or pipelines)**

Only trained commercial divers with the proper equipment should enter and then only if they are following safety regulations. Recreational scuba divers should not be used, as they do not have the required training, certification, or equipment. Divers should follow rules regulating commercial diving.



### **Farm ponds and cisterns**

Where practical, ponds and cisterns should be fenced and posted to keep unauthorized persons out. If a pond or cistern is used for swimming or presents a risk of drowning to others, consider installing a nearby rescue post with a flotation life ring and a length of rope attached to the post.

### **Liquid manure and slurry storage pits, ponds, lagoons or tanks**

When possible, place lids on manure pits and tanks. For above ground manure storage structures fence and place warning signs such as “Keep Out” or “Danger! Manure Storage.” During warm weather open manure lagoons can appear deceptively solid.

### **Wells**

Cover securely and post warning signs. If you are required to enter, confined space rules should be followed. Old, unused wells should have solid covers that can’t be easily removed. If possible, fill in old wells to completely remove the hazard.

### **Well tailing pits**

Fence and post warning signs. Design and construct the pit so a person could escape if they fell in.

### **Lakes, reservoirs, rivers, and streams**

If appropriate, fence and post warning signs at potential access areas. If using diving equipment to enter bodies of water for underwater commercial diving work, follow rules regulating commercial diving. Remember, in cold water the body loses heat fast and hypothermia, or lowered body temperature, may result in death.

### Getting Help

- The National Children's Center for Rural and Agricultural Health and Safety has created a "Drowning Prevention Resource Packet" available from National Children's Center for Rural and Agricultural Health and Safety, Marshfield Clinic, 1000 North Oak Ave., Marshfield, WI 54449 or at their website: <http://research.marshfieldclinic.org/children/Resources/Drowning/drowning.htm>
- The Modesto Irrigation District Canal Safety Program focuses on educating children about water safety. They have produced educational materials. To learn more about their program, see their website: [http://www.mid.org/html/canal\\_safe.htm](http://www.mid.org/html/canal_safe.htm). Or contact Public Affairs at 209-526-7390.

### Washington State Regulations

- WAC 296-37 Commercial diving
- WAC 296-62 Confined spaces (for well entry and some diving operations)

### WISHA Consultation Program

Washington State  
Department of Labor and Industries

---

**Everett (Region 1, Northwest Washington)**  
425-290-1300

---

**Seattle (Region 2, King County)**  
206-281-5400

---

**Tacoma (Region 3, Pierce, Kitsap, Clallam, and Jefferson Counties)**  
253-596-3800

---

**Olympia (Region 4, Southwest Washington)**  
360-902-5799

---

**East Wenatchee (Region 5, Central and Southeastern Washington)**  
509-886-6500

---

**Spokane (Region 6, Eastern Washington)**  
509-324-2600

### WA Fatality Assessment & Control Evaluation (FACE) Program

Safety and Health Assessment and Research for Prevention (SHARP) Program  
WA State Department of Labor and Industries  
PO Box 44330  
Olympia, WA 98504  
(360) 902-5669 or; 1-888-667-4277 (toll-free)  
<http://www.lni.wa.gov/sharp/face>  
[clav235@lni.wa.gov](mailto:clav235@lni.wa.gov)

The Safety and Health Assessment and Research for Prevention (SHARP) Program at the Washington State Department of Labor and Industries is funded by the National Institute for Occupational Safety and Health (NIOSH) to run a Fatality Assessment and Control Evaluation (FACE) Program in Washington State (Cooperative Agreement No.: U60/CCU-13928-05). The FACE Program collects information on all work-related fatalities in Washington State, investigates select incidents using a safety systems/root-cause approach, and develops reports and other outreach activities. The Program is not compliance-oriented and has a goal of reducing the number of work-related acute trauma injuries and deaths.

