

General Information

At WRPS our mission is to eliminate the risk posed by 53,000,000 gallons of radioactive and chemical waste stored in 177 underground tanks. The waste is a legacy of World War II and Cold War production of nuclear materials for the nation's defense. Managing this work is often complex and hazardous, yet our safety statistics confirm our commitment to doing this work safely every day. Whether it is crane and rigging work, electrical or piping installations or the operations of the many systems required to keep the waste safe, our highly trained and experienced workforce gets the job done.

Hanford is home to the nation's largest volume of radioactive and chemical waste and it is our responsibility to manage this waste until it is prepared for disposal. We are also integrating new and innovative technologies into our strategy.

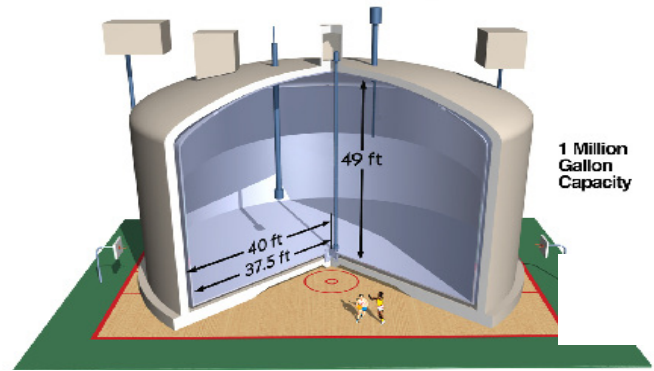
- Waste storage tanks range in size from 55,000 gallons up to 1.1 million gallons
 - There are 149 single-shell tanks built between 1943 and 1964
 - There are 28 double-shell tanks built between 1968 and 1986
- Tanks are grouped into 18 "farms" with anywhere from two to eighteen tanks per farm.
- The tanks are located near the center of the 586 square-mile Hanford Site, approximately 250 feet above the water table and are divided between two locations known as the 200 West Area and the 200 East Area which are about seven miles apart.
- In the past up to 67 of the single-shell tanks are known or suspected to have leaked as much as one million gallons of waste to the surrounding soil.

Moving Liquid Waste to Newer, Safer Tanks

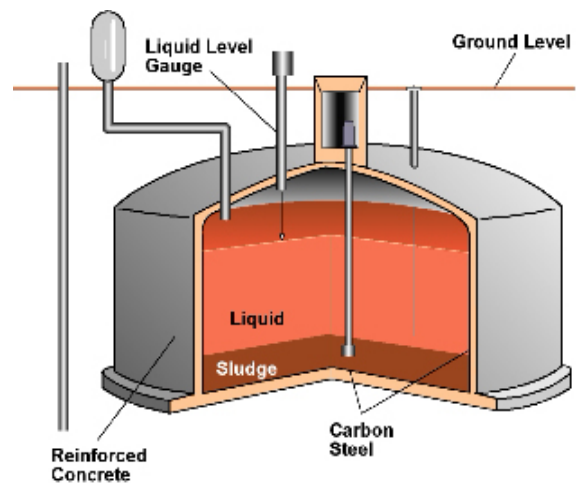
Pumpable liquids were removed from most of the 149 single-shell tanks to reduce the risk of future leaks. Approximately 2.9 million gallons of retrievable liquid waste was transferred to safer double-shell tank storage between 1998 and 2004.

What Happens to the Remaining Waste?

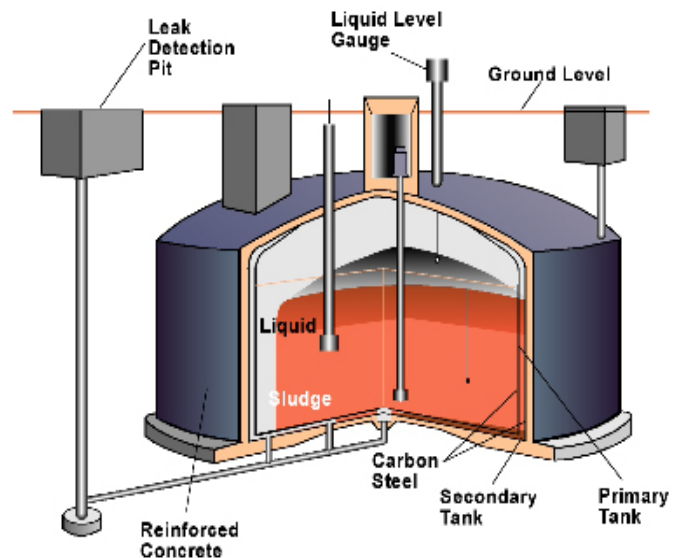
The solid material remaining in the single-shell tanks includes saltcake and sludges, plus a hardened layer of material known as the "heel" at the bottom. The tanks may contain one or all of these waste forms. A program to move these waste forms to safer double-shell tank storage has been under way for several years.



1 Million Gallon Tank Shown for Scale



Typical Single-Shell Tank



Typical Double-Shell Tank

Methods Being Used to Remove the Waste

Moving Waste to the Pump

Because of the variety of waste forms in the tanks, a variety of tools are required to mobilize the waste so it can be pumped out

- **Saltcake dissolution** sprays water or liquid waste from above the waste to dissolve solid material so it can be pumped.
- Modified sluicing is similar to saltcake dissolution but uses less water at a lower pressure than traditional sluicing methods.
- **High Pressure Mixer** inserts a high pressure jet of water directly into the waste to thin it so it can be pumped. The mixer is directional so jets of water can also be used to clear the intake of the pump and prevent clogging.
- **Fold Track®** is a remotely-operated crawler-tractor device that uses a blade to push waste to a central pump when traditional methods don't sufficiently mobilize the waste. It can stretch itself out so it can fit down a 12" pipe into the tank, then reconfigure itself to do the job.
- **Salt Mantis** is a remotely-operated crawler device that burrows into the hardened waste and breaks it up using high pressure water (up to 35,000 pounds per square inch) at low volumes (up to 5 gallons per minute) to break up and mobilize the waste.
- **Vacuum Retrieval** uses an above-ground vacuum system to remove waste from the tanks. It is ideal for tanks that are known to have leaked because it uses low volumes of water at very high pressure to break up the waste and removes the water almost as soon as it is sprayed.

Retrieval Objectives

Under terms of the Tri-Party Agreement which directs Hanford Cleanup, WRPS is required to remove 99% of the waste in the tanks, or remove waste until the limits of technology have been reached, whichever is greater.

Progress

We completed waste retrieval from the first underground storage tank C-106 in December 2003. It was Hanford's most troublesome tank because the solid materials at the bottom of the tank produced heat, requiring the periodic addition of water to keep the waste cool. Removal of the waste was complex and challenging, but set the stage for future retrieval activities.

Since then waste has been removed to regulatory standards from five other tanks and has been partially removed from other tanks, removing more than 1.5 million gallons and more than eleven million curies.

Safety

- To meet our stewardship commitments we are maintaining an active tank integrity program to ensure that the double-shell tanks will continue to serve until all of the waste has been removed.
- We are aggressively upgrading our single-shell tank integrity program with the assistance of an independent panel of experts.
- We are putting in place the environmentally-compliant infrastructure necessary to transfer waste from our tank farms to the nearby Waste Treatment Plant.
- Our safety record has been shown to be among the best in the DOE complex for companies doing our type of work.



Aerial view of the Hanford central plateau where 177 underground radioactive waste storage tanks are located near the center of the 560 square-mile Hanford Site.

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