

Hanford Groundwater



Pump and treat system on the center of the Hanford Site.



Groundwater containing hexavalent chromium being sampled from wells along the Columbia River.

The U.S. Department of Energy and contractor CH2M HILL Plateau Remediation Company are removing contamination from the groundwater beneath the Hanford Site to prevent contamination from reaching the Columbia River.

Contamination in Hanford's groundwater resulted from the site's plutonium production for the nation's defense dating back to the 1940s. Planned and unplanned releases of chemicals from the site's production facilities seeped into the soil and contaminated large areas beneath the surface.

Today, using its global expertise in the water industry, CH2M HILL Plateau Remediation Company (CH2M) is using a mixture of technologies to remove contamination from groundwater and shrink contamination plumes.



Sampling a well monitor the Columbia River.

CH2M's groundwater program includes a network of more than 2,000 wells and other tools. CH2M also collects more than 11,000 samples a year to monitor soil and groundwater contamination. CH2M operates five pump and treat systems along the river and one at the center of the Hanford Site. Together, these systems are treating more than two-billion gallons (7.6 billion liters) of groundwater – enough to line up full water trucks end-to-end from Los Angeles to New York – and removing more than 100,000 pounds (45,359 kilograms) of contaminants per year.

The systems extract contaminated groundwater from the soil via a network of wells and transfer it to a facility for treatment. The treated water is injected back into the aquifer to help drive the contaminated groundwater toward the extraction wells.

New modeling data shows the treatment technologies are effectively cleaning up groundwater and reducing the size of areas of groundwater contamination, called "plumes". The maps on the following page show groundwater contamination plumes along the Columbia River in 2009 and in 2013.

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Pump and treat system removing Hexavalent Chromium from groundwater along the Columbia River.

Cleanup Legacy

Two main areas at the Hanford Site have contaminated groundwater: The area along the river called the River Corridor and the center of the Site called the Central Plateau. Pump and treat systems remove the following contaminants of concern:

River Corridor:

- Hexavalent Chromium
- Strontium

Central Plateau:

- Uranium
- Carbon Tetrachloride
- Nitrate
- Technetium-99
- Trichloroethene
- Chromium



A pump and treat system operator monitors data. Hanford's pump and treat systems operate continuously and can be controlled remotely using wireless technology.

Technology and Efficiencies

Through engineering and innovation, CH2M has expanded and enhanced Hanford groundwater treatment including:

- Installing new wells for monitoring, sampling, extracting and injecting groundwater
- Building three new pump and treat systems, including the 200 West Pump and Treat, Hanford's largest and most sustainably built system
- Expanding Hanford Site groundwater treatment capacity from 500 million gallons in 2010 (1.9 billion liters) per year to over two-billion gallons (7.6 billion liters) per year in 2016
- Using a new resin (a material used to treat groundwater) that has saved \$20 million since 2013
- Expanding a chemical barrier below the surface that will essentially lock the contaminant strontium-90 in place to decay
- Installing monitoring wells to track plumes as they shrink or the water table changes
- Adding the treatment capability to remove uranium from groundwater during treatment

