

Fluor Hanford

Groundwater Remediation Project

Overview: Spring 2006

The Challenge

In 1998, the Groundwater Remediation Project (GRP) was established as Hanford's newest major cleanup endeavor. Now managed by Fluor Hanford, it is a cross-cutting project that works with scientists from Pacific Northwest National Laboratory and other Site contractors and subcontractors to understand and remediate contamination plumes that could affect the Columbia River.

The Groundwater Remediation Project has four major tasks: shrink the footprint of contaminated areas; reduce "recharge" (or re-supply) of clean or contaminated water that may drive soil contaminants deeper into the subsurface; implement final groundwater remedies; and integrate groundwater monitoring needs. To accomplish these tasks, GRP operates seven major pump-and-treat systems at key locations on the Hanford Site where concentrated plumes of contamination can be intercepted and cleaned. The project also manages test systems in the 100-D, 100-K, and 100-N Areas that apply new approaches to chemically alter the contaminants in groundwater.

In addition, GRP decommissions old wells that are preferential pathways for contaminants to move into groundwater; and drills new monitoring, extraction and injection wells. Extensive monitoring programs, underground mapping, records searches, and investigations of new technologies to provide better remedies for groundwater contamination are also vital parts of GRP.



Fifty years of plutonium-production operations put approximately 450 billion gallons of liquid wastes into the soil of the 560-square mile Hanford Site. The liquid releases included chemicals used in manufacturing and rinsing uranium fuel, laboratory experiments, dissolving fuel after it was irradiated in Hanford's nuclear reactors, and liquefying plutonium scraps needed to feed other operations. Chemicals were also added to the water that cooled Hanford's reactors, to prevent corrosion in the reactor tubes. In addition, water and acid rinses were used to clean radionuclide deposits from piping in Hanford's large radiochemical facilities. All of these chemicals became contaminated with radionuclides.

As Hanford raced to help win World War II, and then produce materials for the Cold War, these radioactive wastes were disposed to the Site's sandy soils. Some early scientific experiments showed that the most highly radioactive components of these liquids would bind to the soil closest to, and just below, the land surface, thereby posing no threat to groundwater. Other experiments predicted that the water containing most radionuclides would take hundreds of years to seep into groundwater, decaying (or losing) most of its radioactivity before reaching the groundwater or subsequently flowing into the Columbia River.

Yet, clear evidence today demonstrates that many contaminants have reached the groundwater and the Columbia River, with more en route. Currently, about 100 square miles of groundwater on the Hanford Site have contaminant levels above drinking-water standards.

Accomplishments

Installed new test barrier to contain strontium contamination in 100-N Area, Fall 2005



- Will bind Sr-90 in chemical matrix while it decays

Relined three aging water pipes in U Plant Area, Fall 2005



- Prevents "recharge" of water driving contaminants to groundwater

GROUNDWATER
REMEDATION PROJECT

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Groundwater Remediation Project

Exceeded drilling requirements for new wells, **2005-2006**



- Met all TPA milestones on time or early

Decommissioned and sealed hundreds of old wells, **Ongoing**



- Program prevents old wells from being a passageway for contaminants entering the groundwater

Conducted treatability test for new groundwater remediation system in 100-K Area, **Summer 2005 - Spring 2006**



- 100-KR-4 system changes detrimental chromium-6 to harmless chromium-3 in groundwater

Started up four new extraction wells in 200-West Area to remediate carbon tetrachloride plume, **June 2005**



- 200-ZP-1-2 wells expanded cleanup flow rate by 50 percent

What's Next



Shut down pump-and-treat system in 100-H area, after successfully remediating plume of chromium-6 in groundwater, **Fall 2006**



Start up expanded treatment systems in 100-D Area, **Late 2006**



Install new treatment system to capture chromium-6 plume in K West Area, **Late 2006**



Inject treatment barrier chemicals in 100-N Area to fix SR-90 in place, **2006**



Complete integrated assessment of technetium-99 plume in T Tank Farm Area, **2006**



Drill 15 more new wells, **2006**



Our Goal Is Zero Accidents!