



# HANFORD FORWARD



COVER STORY **CENTRAL PLATEAU**

## GLOVE BOX REMOVED

**RIVER CORRIDOR**

Spraying Seed  
Along the River

**INNER AREA**

VIT PLANT –  
Receives First  
Shield Windows

# ABOUT HANFORD



The Richland Operations Office (RL) oversees cleanup along the Columbia River and in Hanford's Central Plateau, including groundwater and waste site cleanup, management of solid waste, spent nuclear fuel and sludge; facility cleanout, deactivation and demolition, environmental restoration; plutonium management; and all site support services.



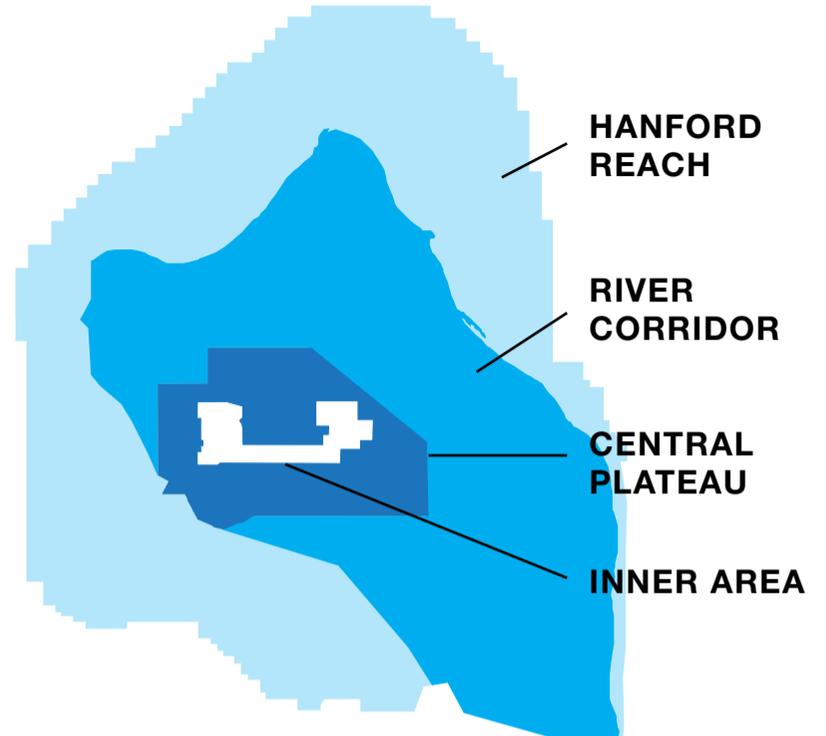
CH2M HILL Plateau Remediation Company (CH2M HILL) is the prime contractor for the safe, environmental cleanup of the Central Plateau at the Hanford Site. This task includes decommissioning and demolishing the Plutonium Finishing Plant that once stored secret stores of material for the nation's defense, cleaning up plumes of contaminated groundwater beneath the site, and removing highly radioactive "sludge" away from the Columbia River.



A joint venture between Lockheed Martin, Jacobs Engineering and WSI, Mission Support Alliance (MSA) is responsible for safely and effectively managing and operating the infrastructure of the Hanford Site. MSA provides a robust array of services, including training, site security, roads and utilities, logistics and transportation, information resources, information technology and other services, enabling Hanford contractors to focus on their cleanup efforts.



Washington Closure Hanford manages the 220-square-mile River Corridor Closure Project for the U.S. Department of Energy's Richland Operations Office at the Hanford Site. The Project is the largest environmental cleanup closure project in the nation. Washington Closure is a limited liability company owned by URS, Bechtel and CH2M HILL. The company is responsible for demolishing 328 contaminated buildings, cleaning up an estimated 560 waste sites, placing two former plutonium production reactors and one nuclear facility in interim safe storage, and managing the Environmental Restoration Disposal Facility.



The Office of River Protection (ORP) is responsible for the retrieval, treatment and disposal of Hanford's 56 million gallons of radioactive tank waste, currently stored in 177 underground tanks in the central part of the site. In support of this mission, ORP manages the Tank Operations Contract and the Waste Treatment & Immobilization Plant Project.



Bechtel National, Inc. (BNI) is the prime contractor and URS, Inc. is the major subcontractor, to design, construct, and commission the DOE Waste Treatment Plant (WTP) at the Hanford Site. This mammoth construction project is the largest of its kind in the world. When complete, the WTP will be used to transform the 56,000,000 gallons of radioactive and chemical wastes being stored in underground tanks at Hanford into a stable glass form for permanent disposal.



Maintaining the underground waste storage tanks at Hanford falls under the jurisdiction of Washington River Protection Solutions (WRPS). This organization is responsible for storing and retrieving the approximately 56 million gallons of nuclear and chemical waste stored in these tanks at the Hanford Site. WRPS is owned by URS Corporation and Energy Solutions, with AREVA as the primary subcontractor.

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# Large Glovebox has left the Building

CH2M HILL Plateau Remediation Company (CH2M HILL) completed removal of one of the largest, most complex pieces of equipment from Hanford's Plutonium Finishing Plant (PFP).

The 10-ton piece of contaminated equipment, called a glovebox, was more than a story high and was used in the 1960s to store Plutonium oxide jars.

"This is one of the most complex gloveboxes we have worked on to date. It took a lot of preparation and a dedicated support team to safely execute this work," said Mike Swartz, CH2M HILL Deputy Vice President of the Plutonium Finishing Plant Closure Project.

From 1949-1989, the PFP produced plutonium oxides and metals. Hanford produced nearly two-thirds of the plutonium used in the country's nuclear weapons program. Gloveboxes are large,



sealed pieces of equipment with protective gloves attached to ports in the glovebox walls. Years ago, the boxes allowed workers to safely handle materials for plutonium production and processing.

Removal of the large glovebox posed a greater challenge due to its location in the facility, the size, the contamination and the equipment needed to safely execute the work. CH2M HILL engaged workers in the work process as it was planned.





“We came up with several innovations to prepare for this high hazard work including a mockup box, which enabled workers to practice with the tools and techniques to ensure the work was deployed right the first time, protecting our workers and saving time and money,” said Swartz.

During the removal process, workers isolated the glovebox from various systems (electrical, ventilation, monitoring), and decontaminated to the extent possible. It was disassembled in pieces in order to get it out of the facility.

The most hazardous pieces of the glovebox will be shipped for disposal to the Waste Isolation Pilot Plant (WIPP), a plant in New Mexico that safely disposes of the nation's defense-related transuranic radioactive waste.

“We are glad to know this high risk work is being done safely and in a timely matter. The work done at PFP will help in meeting the Tri-Party agreement milestone of demolishing the facility by 2016,” said Larry Romine, DOE Federal Project Director.

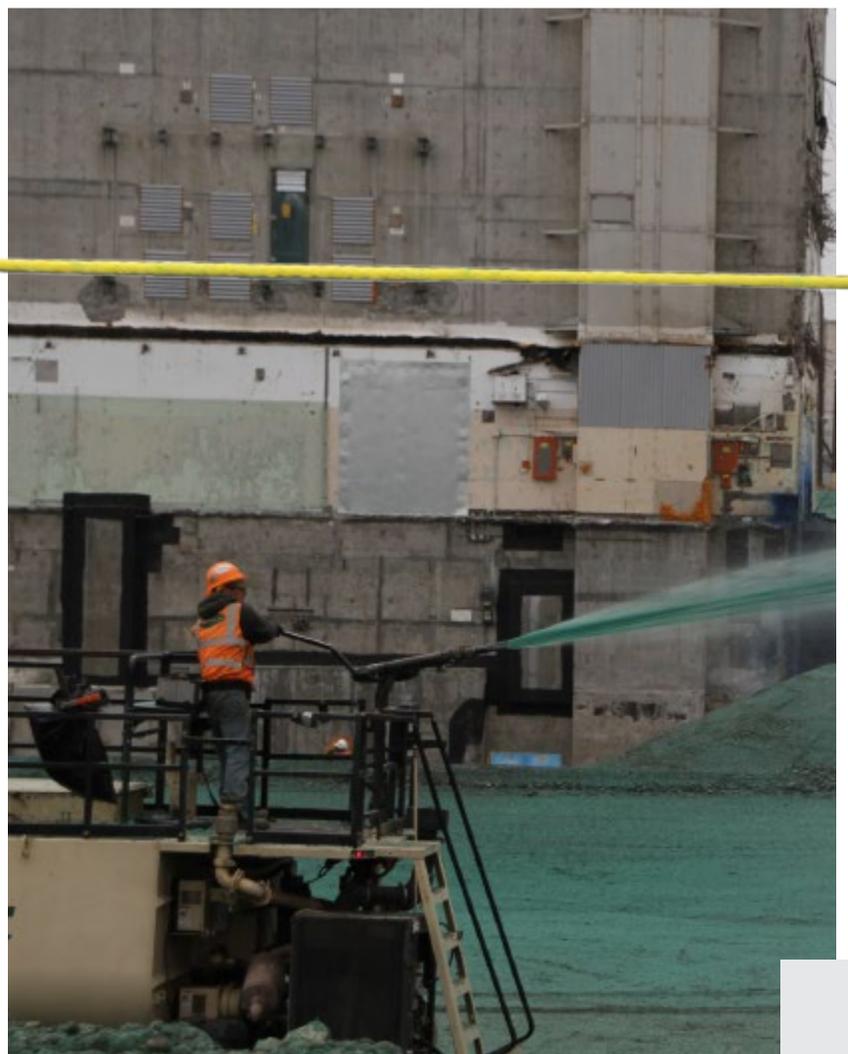
CH2M HILL plans to remove a total of 232 gloveboxes from the Plutonium Finishing Plant; so far workers have removed 180 gloveboxes, or 77 percent, of the gloveboxes in the PFP Complex.



# GOING GREEN ALONG the RIVER

Things are looking a little greener along the Columbia River where U.S. Department of Energy contractor CH2M HILL Plateau Remediation Company sprayed seed to revegetate areas surrounding the K East Reactor, one of nine former plutonium production reactors at the Hanford Site. The areas are former waste sites that CH2M HILL excavated in previous years to remove contamination that resulted from reactor operations and discharges. CH2M HILL is the contractor responsible for shrinking the cleanup footprint surrounding the K East Reactor, as well as the neighboring K West Reactor, to prepare the structure for eventual long-term safe storage.





# VIT PLANT RECEIVES FIRST SHIPMENT OF

# SHIELD WINDOWS

In September, the Vit Plant received the first of 87 specially designed, leaded-glass shield windows for the Pretreatment, High-Level Waste Vitrification, Low-Activity Waste Vitrification facilities and the Analytical Laboratory.

The windows are designed to work as a barrier between the radioactive and nonradioactive areas of the facilities and will allow operators to safely observe the work going on in the radioactive hot cells. The first shipment of 22 windows is for the Analytical Laboratory.

Each shield window weighs 7,200 pounds, is 16 inches thick and measures 75 inches wide, by 65

inches tall. The windows themselves have a yellow tint and are made of borosilicate glass and lead.

The windows were manufactured by Hot Cell Services Corporation of Kent, Wash.

The shield windows will be one of the last items to be placed in the Laboratory, and will be stored in a controlled environment until they are installed in the fall of 2013. The long lead time on the procurement is necessary because it takes a year to manufacture the windows.

The balance of the windows will be delivered in early 2013. Once installed, the windows will go through yearly maintenance and testing.



# WAREHOUSE CONSOLIDATION

# Saves Money and Space

As the site integrator, MSA works to speed the process and minimize the efforts of cleaning up Hanford by leading collaboration efforts between site contractors.

One example of this integration is the initiative to evaluate consolidation of similar functions among site contractors. MSA initiated a pilot project for consolidating warehouse related activities in fall 2011.

Working with CH2M HILL Plateau Remediation Company and Washington River Protection Solutions on the warehouse pilot project, MSA successfully demonstrated that collaboration efforts among site contractors could result in process improvements and cost-cutting opportunities.

In April 2012, the warehouse consolidation plan gained approval, allowing personnel to move ahead with aggressively excessing unneeded materials to free up warehouse space. Employees then filled the freed up space with materials consolidated from other facilities. This consolidation enabled site contractors to use existing government-owned space for their storage needs rather than leased space, and ultimately provided cost savings.

MSA identified the 2101M building in the 200 East Area as the primary consolidation warehouse for site contractors due to its centralized location and large storage capacity.

To date, workers have reviewed approximately half of the 14,400 spare parts and convenience storage line items presently stored in 2101M some dating back to the 1980s or earlier to determine whether to retain or excess those items. Most materials deemed excess are being transferred to the Tri-Cities Asset Reinvestment Company (TARC) for local economic development purposes. MSA is transferring other items to various government entities, or is recycling them.

John Horton, who manages MSA's Property and Warehouse Management group, says cooperation and coordination among the contractors has been the key to success for this project.

"Site cost savings are projected at over \$500,000 per year beginning in January of 2013, and are primarily from vacating leased warehouse space," said Horton.



**Chano Cuello,**  
Lead Storekeeper at  
2101M Warehouse

# Retrieval of Tenth Single-Shell Tank Complete at Hanford

Third Single-Shell Tank Emptied at Hanford's C Farm over the past year

## C FARM JUNE 2012

Washington River Protection Solutions has successfully removed waste from a tenth storage tank at Hanford. Located in C Farm, C-109 is one of 16 underground tanks ranging in capacity from 55,000 to 530,000 gallons.

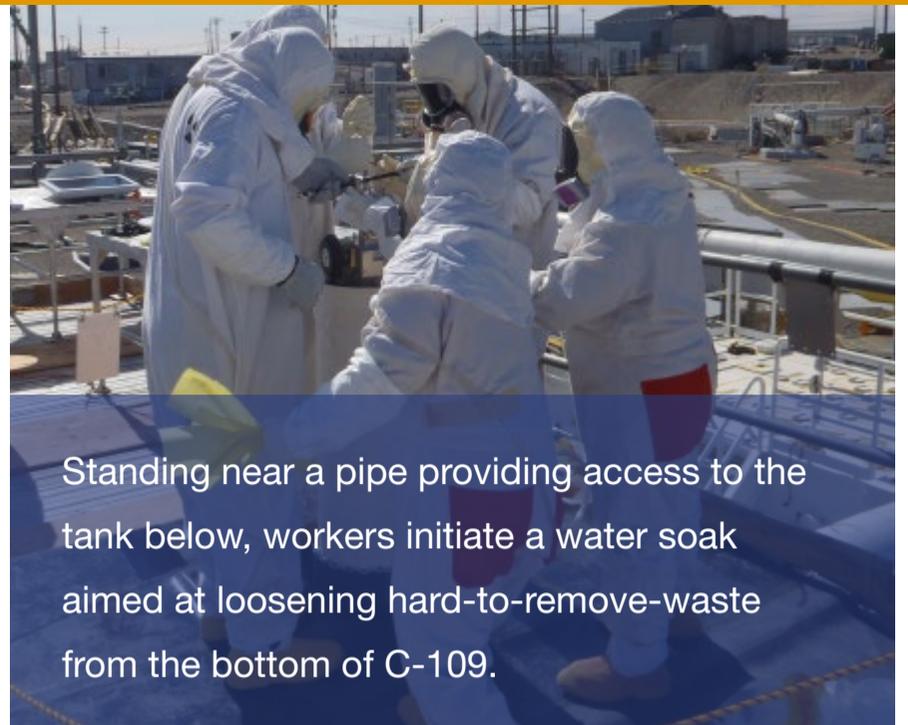
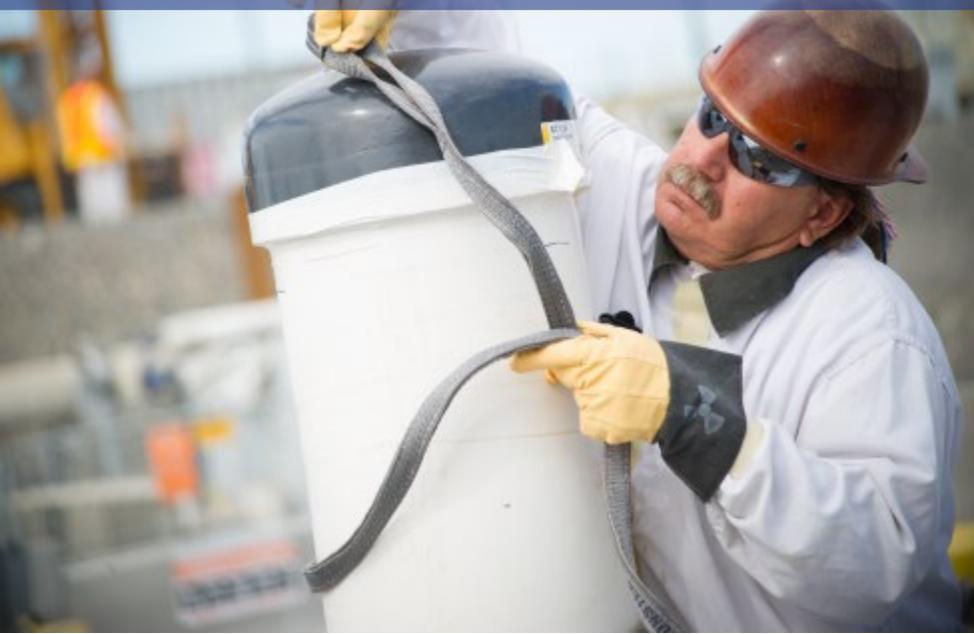
Washington River Protection Solutions (WRPS) has completed retrieval of radioactive and chemical waste from the tenth underground waste storage tank at Hanford. C-109 was the third single-shell tank completed in 2012.

An engineering evaluation in the field shows the waste volume in C-109 is below the regulatory requirement of 360 cubic feet of waste remaining in the tank. Video of the 530,000-gallon-capacity tank shows a large percentage of the tank bottom is now visible.

“The completion of retrieval activities in C-109 marks a historic achievement at Hanford tank farms,” said Kent Smith, WRPS Single-Shell Tank Retrieval & Closure Manager.

Retrieval of C-109 began in 2007 using modified sluicing as the first retrieval technology. This process used recycled liquid waste from a nearby double-shell tank to mobilize the waste to the center of the tank where it was pumped and transferred to a receiving tank. This process continued for about a year at which point the bulk of the waste was removed, leaving an estimated 8,600 gallons of

A crane and rigging worker prepares to lift equipment into position near C-104.



Standing near a pipe providing access to the tank below, workers initiate a water soak aimed at loosening hard-to-remove-waste from the bottom of C-109.

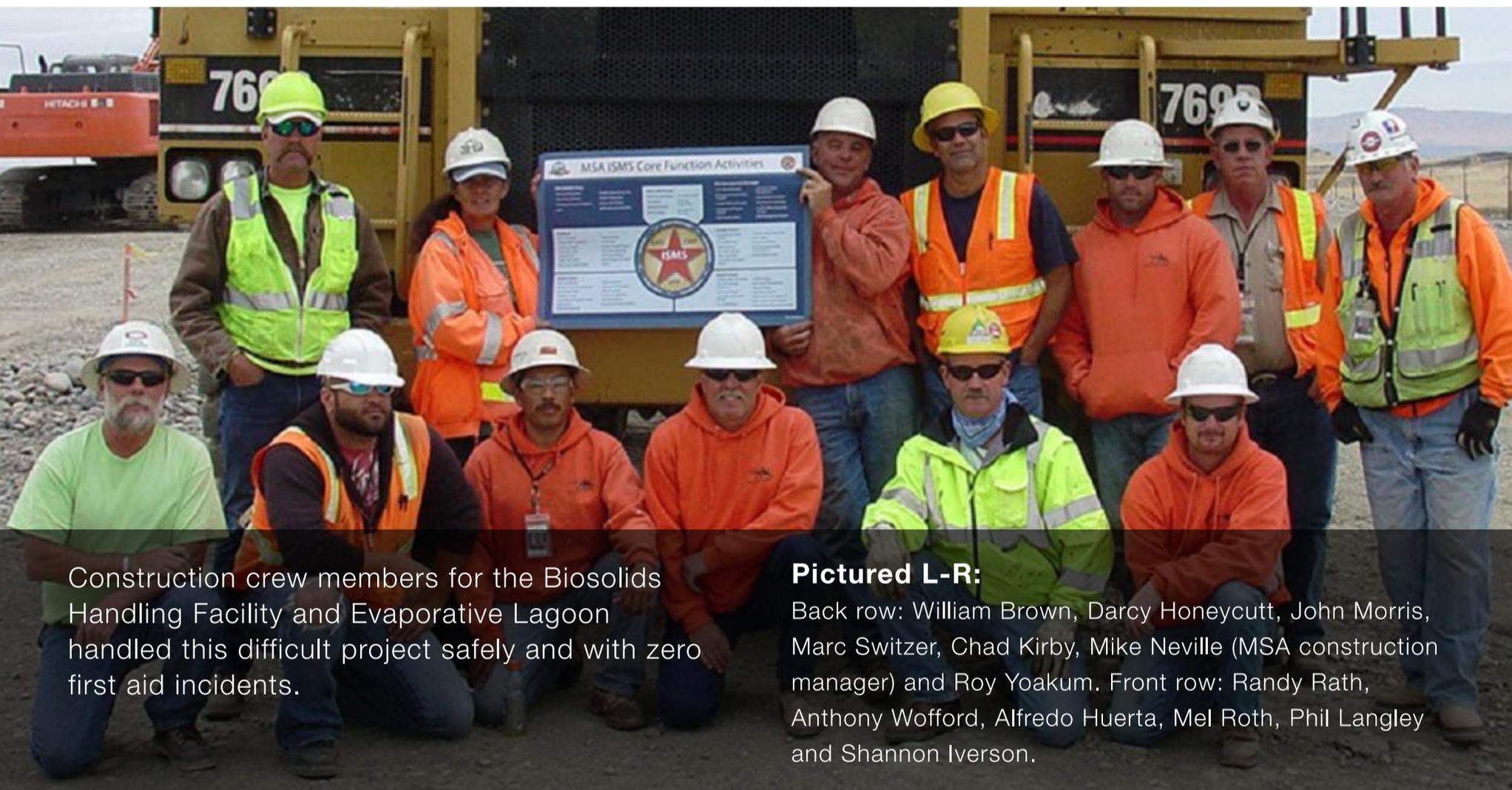
hard-heel waste to be retrieved.

Then, crews began a two-step chemical soak process to dissolve the hardened remaining waste, first by performing a water soak and then adding sodium hydroxide to the tank to loosen and break down the hardened waste at the bottom of the tank. This chemical dissolution process has been used successfully in two other Hanford tanks, C-104 and C-108.

Most recently, waste retrieval began in Tank C-101, a single-shell tank containing roughly 88,000 gallons of waste.

In all, crews removed waste from six different underground tanks in 2012, completing retrieval activities in three tanks, removing the bulk of the material from another two and starting retrieval in a sixth. And, for the first time in Hanford history, workers removed waste solids from three different tanks simultaneously.

# Biosolids Handling Facility Evaporative Lagoon Operational



Construction crew members for the Biosolids Handling Facility and Evaporative Lagoon handled this difficult project safely and with zero first aid incidents.

**Pictured L-R:**

Back row: William Brown, Darcy Honeycutt, John Morris, Marc Switzer, Chad Kirby, Mike Neville (MSA construction manager) and Roy Yoakum. Front row: Randy Rath, Anthony Wofford, Alfredo Huerta, Mel Roth, Phil Langley and Shannon Iverson.

In early October, MSA and DOE held a ribbon cutting ceremony at the newly operational Biosolids Handling Facility and Evaporative Lagoon in 200 West Area. Kirk McCutcheon, MSA's vice president for Project Planning & Integration recognized the project team for their valued efforts in completing this large project and working over 60,000 injury-free hours.

MSA's Site Infrastructure and Logistics staff will now be running the new zero effluent discharge waste water treatment system for the 200 and 600 Areas on the Hanford Site. The new facility replaces the 100N Sewer Lagoon that has been turned over to Washington Closure Hanford for remediation.

## Did You Know?

- Approximately 250,000 cubic yards of soil moved during construction
- Capacity of evaporative lagoons: 21 million gallons
- Anticipated annual biosolids volume: 6-12 tons
- Evaporation surface area: approximately 15 acres
- Construction site area: approximately 30 acres
- Lagoon depth: approximately 8 feet
- Capacity: 55,000 gallons per day/38 gallons per minute
- More than one mile of perimeter fence installed



McCutcheon addresses the crowd from the podium during the ribbon cutting at the new Biosolids Handling Facility and Evaporative Lagoon located in Hanford's 200 West Area.

# WORKERS REMOVE TRIGA REACTOR

Workers from Washington Closure Hanford and sub-contractors Phoenix LLC and Barnhart removed the first of the “big nasties” in the 300 Area. Adjacent to what was the 308 Building, and below the surface, was a test reactor that had been flooded with concrete material. It was lifted onto a special trailer for heavy shipments to the Environmental Restoration Disposal Facility (ERDF). The Training, Research, Isotopes, General Atomics (TRIGA) reactor began operations in the early 1970s and rested below the former 308-A high-bay.

The cemented reactor monolith was hoisted on to a heavy duty trailer and hauled along a compacted ramp from what was the below grade footprint of the Fuels Development Laboratory or 308 Building. Sitting approximately 24 feet below grade, the 250-ton reactor was used to perform neutron radiography quality testing on spent fuel elements and nuclear fuel components for the Fast Flux Test Facility (FFTF).

The weight of the reactor monolith required a gantry system to lift it onto the trailer. The December shipment went smoothly and arrived safely at ERDF where it was placed in its final resting place.

The TRIGA reactor was the smallest of three major removal projects scheduled for this winter and spring in the 300 Area. The 300 Area, a few miles north of the City of Richland, was the center of Hanford’s radiological research and nuclear fuel fabrication. The 308 Building complex demolition is essentially complete now that the reactor is removed.

