



HANFORD FORWARD



COVER STORY TANKS

First Pump Removed from Tank AY-102

SITEWIDE

2015 Hanford Tour Season

TANKS

7 Waste Treatment Plant Fast Facts

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 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.



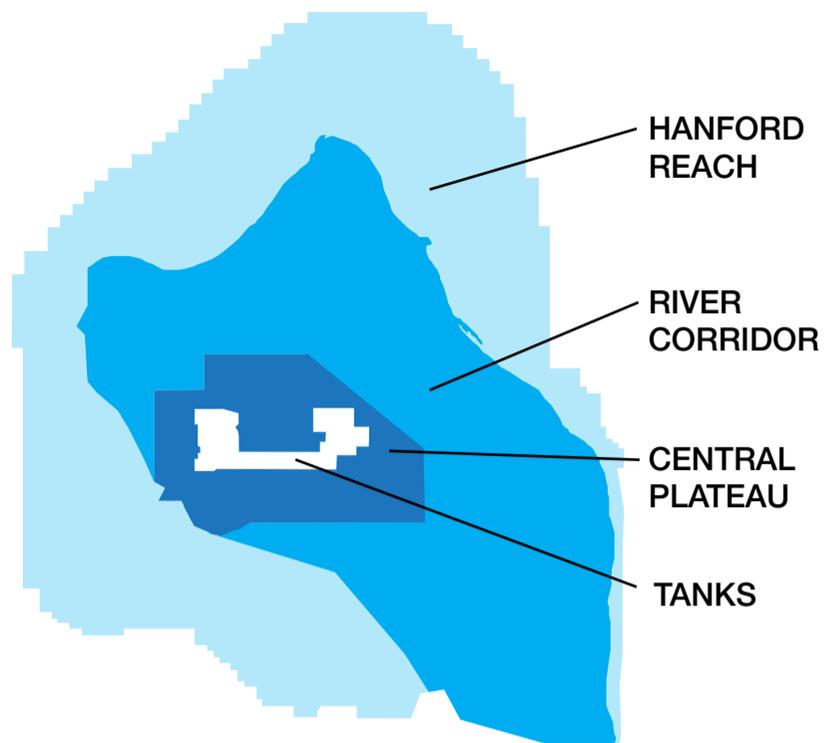
HPMC Occupational Medical Services (HPMC OMS) provides occupational medical services to the Department of Energy and Hanford prime contractors and subcontractors. HPMC OMS has clinics in Richland and in the 200 West area of the site and is responsible for the medical surveillance, medical qualification, health, and wellness needs of more than 7,500 Hanford workers.



A joint venture between Lockheed Martin, Jacobs Engineering and Centerra Group, Mission Support Alliance (MSA) is responsible for safely and effectively managing and operating the infrastructure of the Hanford Site. MSA provides an 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 (WCH) manages the 220-square-mile River Corridor Closure Project for the 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, owned by AECOM, Bechtel and CH2M HILL, is responsible for demolishing 320 contaminated buildings, cleaning up an estimated 590 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.



Advanced Technologies and Laboratories (ATL) International, Inc. is an award-winning technology, engineering, scientific, and project management services provider to the U.S. Department of Energy. ATL operates the 222-S nuclear laboratory that is fully compliant with the most stringent business, safety, health, quality, and technical requirements in the country. In 2008, ATL was awarded DOE's Voluntary Protection Program (VPP) Star award for outstanding health and safety performance at the Hanford Site.



Bechtel National Inc. is designing, building and commissioning the world's largest radioactive and chemical waste treatment plant. AECOM is BNI's principal subcontractor. The Waste Treatment and Immobilization Plant is being built for the U.S. Department of Energy at the Hanford Site in southeastern Washington state. When completed, it will be used to solidify the radioactive liquid waste stored in 177 aging underground tanks using a process called vitrification.



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 AECOM and Energy Solutions, with AREVA as the primary subcontractor.

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Cleanup Nears Completion at N Reactor

When the River Corridor Closure Contract was issued by the Department of Energy Richland Operations office (DOE-RL) in 2005, hundreds of buildings and waste sites needed to be cleaned up along the Columbia River. As of January that is no longer the case after the Washington Closure team completed backfill and revegetation around N Reactor, the last of Hanford's nine plutonium production reactors to be shut down in 1987.

A total of 726,000 tons of soil was used to backfill and contour where 114 facilities and 107 waste sites once were located. The backfill campaign left the area with a more natural looking appearance by planting natural vegetation. The revegetation team planted over 45,000 plants and 1,500 pounds of seed and laid over 100 tons of hay. Revegetation can take place only during the winter planting season. All that remains are a few small sites and access roads that will be remediated and revegetated next year.

The N Reactor operated from 1963 to 1987. The reactor was unique in that it was the only one in the nation that produced both plutonium and electricity. With more than 24 years of operation, it was the longest running reactor at Hanford.

“The most important piece of this campaign is we’re safely getting our cleanup work done while meeting our regulatory milestones on the River Corridor Project.”

Mark French, federal project director of the River Corridor

“The completion of the revegetation is a final part of significant cleanup progress being made by Washington Closure and its subcontractors to clean up the River Corridor in a safe and cost efficient manner,” said Scott Sax, president and project manager for Washington Closure.

The River Corridor Closure Project, which Washington Closure manages for DOE-RL, is the largest environmental cleanup closure project in the nation – a 220-square-mile area along the banks of the Columbia River in southeastern Washington state. Through efficiencies, the project will complete 11 1/2 years of cleanup work scope in just 10 years. ■



Aerial of 100 N Area with new production reactor during construction, April 1962.



Aerial of 100 N Area – December 2014.

Glove Box Removal at **Plutonium Finishing Plant**

Employees at Hanford's Plutonium Finishing Plant reached a key point in their preparations to demolish the Cold War-era plutonium production facility. All glove boxes in the main part of the plutonium production area of the building are now off ventilation. Removing a glove box from ventilation is a critical step in making the glove box safe for dispositioning ahead of building demolition.

During plutonium production, glove boxes allowed employees to safely manipulate plutonium-bearing material throughout the production process. Today, these structures, some large enough to span two stories, are contaminated. They must be cleaned out and removed from the building, or cleaned out and be prepared for removal from the building during demolition. Removing a glove box from ventilation is a critical step in making that glove box safe for dispositioning.

Several structures make up the Plutonium Finishing Plant, the largest of which is the facility where plutonium was processed into hockey puck-size "buttons" for use in weapons. Work continues preparing that building for demolition, including removing contaminated ventilation ducting and process lines. Inside the Plutonium Reclamation Facility, which supported Plutonium Finishing Plant processes by recovering plutonium from scrap metals, crews are removing the remaining contaminated pencil-shaped processing tanks.

Overall the Plutonium Finishing Plant is in the final stages of cleanup with approximately 75 percent of the facility ready for demolition, with demolition to be complete by September 30, 2016. ■



An employee at Hanford's Plutonium Finishing Plant uses a portable band saw to cut the last ventilation duct attached to the last glove box inside the former processing portion of the facility. This work is performed inside plastic enclosures to limit the spread of contamination.

Workers Complete First **Pump Removal** from **Tank AY-102**

Washington River Protection Solutions (WRPS) successfully removed a pump and other legacy equipment from double-shell tank AY-102, some of the first significant steps in preparing the tank for waste retrieval. An agreement between the DOE Office of River Protection (ORP), WRPS and the Washington State Department of Ecology requires pumping waste from this tank to begin no later than March 4, 2016.

Crews used a 135-ton crane to remove two concrete cover blocks with a combined weight of more than 35,000 pounds from one of the pits, providing access to the pit interior for the first time in decades. Specialized long-reach tools were used to safely remove legacy equipment and other debris from the pit. High-radiation conditions inside the pit required the team to take extra precautions before performing any work. The pit was washed down and cleaned with long-reach tools to reduce contamination, then shield mats and barriers were installed for additional contamination control.

Workers then entered the pit to remove additional equipment and install crane rigging. Then, an 80-ton crane was used to raise the 3,500 pound, 55-foot-long pump partially out of the tank. Tools were installed to wash contamination off the pump during removal, and the pump was flushed with water to remove waste from



Workers remove a cover block to allow access to a pit near tank AY-102.



Workers remove a pump from tank AY-102.

inside the equipment. As it was raised, the pump was continually rinsed, pulled through the top of the tank riser into plastic sleeving and wrapped with ropes to trap contamination. The sleeving was then sealed, and a second crane helped move the pump into a horizontal position so it could be placed in a concrete disposal coffin. The coffin was closed, rigged and moved into a “shield cave” for temporary safe storage until it is sent to its final resting place at the Environmental Restoration Disposal Facility, or ERDF.

Put into service in 1971, tank AY-102 is the oldest of Hanford’s double-shell tanks. It holds approximately 774,000 gallons of chemical and radioactive sludge and liquid waste. In October 2012, a leak from the primary tank into the annulus – the space between the inner and outer tank shells – was detected. WRPS continues to monitor AY-102 and has found no evidence of waste leaking into the environment. ORP and WRPS remain committed to safely managing Hanford’s tank farms to protect the workers, public and the environment. ■

Mission Support Alliance Announces **NEW PRESIDENT**

Mission Support Alliance team comprised of Lockheed Martin, Jacobs Engineering and Centerra Group, named Bill Johnson as the new president of the company. Johnson replaces Frank Armijo, who served as company president and general manager since 2010.

Johnson most recently served as vice president of business services for Lockheed Martin Information Systems & Global Solutions, responsible for operations services to PSEG Long Island and the Long Island Power Authority's 1.1 million electric utility customers. Johnson led mission support services such as facilities, security and business performance excellence for the electric utility that has a total annual budget exceeding \$3 billion.

In his new role as vice president of Strategy & Business Development for Lockheed Martin's Information Systems & Global Solutions Civil line of business, headquartered in Maryland, Armijo will oversee the Mission Support Contract at the Hanford Site, in addition to other federal, regulated

utility and energy efficiency projects.

"I am proud of the work and service we have established," said Armijo. "I am especially proud of the people and leadership we have developed with the utmost regard to safety, security, service and cost savings. It has all been accomplished with a strong partnership with Department of Energy and the site contractors. Bill Johnson is an exceptional leader and will be a partner in this critical endeavor."

"Leading a proven team like MSA in support of this important mission is an exciting opportunity," said Johnson. "I will ensure that we remain committed to the partnerships we have developed with DOE and the site contractors. I am looking forward to living in the Tri-Cities area, becoming involved in the community and exploring the Northwest." ■



Bill Johnson, MSA's new president and general manager.

MSA Makes an **Impact** in the **Community**

MSA seeks to make a lasting impact on the Tri-Cities and surrounding region through its corporate giving and community outreach. MSA employees volunteer time, donate funds and contribute in-kind services that support causes which builds and improves the community.

Through community outreach, MSA encourages employees to provide support to local causes through donations of their time or fundraising efforts. MSA



Hanford employees and Tri-Cities Food Bank staff and volunteers load groceries as a part of the Hanford Food Drive.

employees are active with several local organizations.

Support of Junior Achievement is widespread at MSA. Employees form more than 30 teams for the organization's annual bowling fundraiser, raising more than \$16,000 in 2014. MSA has held JA's top fundraising company trophy for five years. Twelve employees also currently serve as Junior Achievement Classroom Consultants, spending anywhere from six-to-10 hours in classrooms across the region to help empower more than 350 young people.

MSA employees also participate in the American Red Cross' annual "Turkey Trot" on Thanksgiving morning, joining hundreds of other Tri-Cities in a fun run to support the efforts of our local Red Cross. Another MSA favorite is the food drive, where Hanford employees donate food and help coordinate efforts on the site. In 2014 more than 15,000 pounds of food were collected and donated to local food banks and the Veterans of Foreign Wars. ■

Substantial **Design** and **Construction** Progress Made at **Vit Plant** in 2014



The Vit Plant is being built on a 65-acre site to immobilize 56 million gallons of liquid radioactive waste stored in 177 underground tanks.

Resuming engineering work on the High-Level Waste Vitrification Facility and placing a large standby diesel generator were just two of the major accomplishments last year at the Hanford Waste Treatment Plant, also known as the Vit Plant, managed by Bechtel National, Inc.

“Our employees continue to advance design and construction at the Vit Plant while remaining committed to safety and quality,” said Bechtel’s Vit Plant Project Director Peggy McCullough. “We have once again achieved our best safety performance in project history with fewer injuries than ever before and were recertified as a Department of Energy Voluntary Protection Program Star site for safety.”

On the design front, Vit Plant employees resumed engineering work on the High-Level Waste Facility after considerable progress was made to resolve the facility’s technical matters. Technicians also began full-scale testing on large, metal vessels similar to those that would be installed in the plant. Results will provide data

to make technical decisions about Vit Plant mixing technologies.

Construction accomplishments include placement of the standby diesel generator, which is part of the 20 facilities and systems that compose the infrastructure necessary to support the four main Vit Plant facilities. The generator can supply 2,250 kW of electricity, enough to support 1,800 average American households.

Significant components of the 300-ton melters in the Low-Activity Waste Vitrification Facility were also installed. When operational, the melters will heat the waste and glass-forming materials to 2,100 degrees Fahrenheit before the mixture is poured into stainless steel canisters for permanent storage.

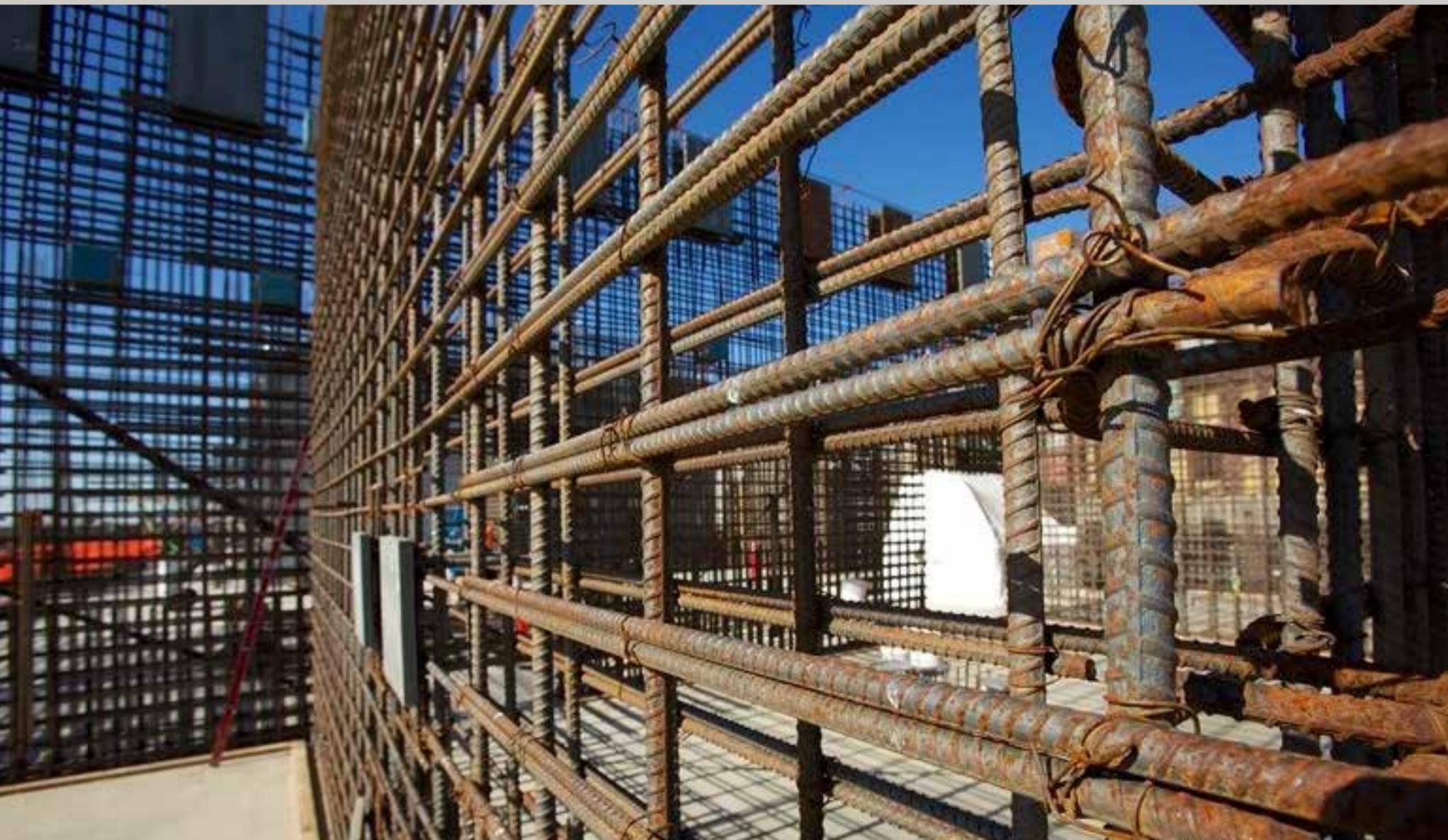
“We are achieving great strides on all fronts—progressing design and construction and making the remaining technical decisions,” McCullough said.

For photos, visit www.hanfordvitplant.com. ■

It Really Is THAT Big: 7 WTP Fast Facts

The Waste Treatment Plant (WTP) spans 65 acres on the Hanford Site in southeastern Washington state. It is composed of four major nuclear facilities and, when complete, will process 56 million gallons of radioactive nuclear waste into a solid glass form. It's been called massive, giant, and enormous, and it is. Just check out the following fast facts:

- 1. Concrete:** WTP requires 263,000 cubic yards of concrete, which is enough concrete to fill 80 Olympic-sized swimming pools.
- 2. Walls:** WTP facility walls are made of concrete reinforced by rebar and are up to 7 feet thick in places.
- 3. Steel:** WTP will contain 41,000 tons of structural steel, which is the equivalent of more than four Eiffel Towers.
- 4. Rebar:** WTP uses #11 rebar in places, which measures 1 3/8 inches in diameter and weighs 5.3 pounds per foot. A section of #11 rebar typically measures 14 to 60 feet long and can weigh more than 300 pounds.
- 5. Cable:** WTP requires 5.3 million feet of cable. If laid end-to-end, it would stretch more than 890 miles, more than the distance from Seattle to Salt Lake City.
- 6. Piping:** WTP requires 900,000 feet of piping. If laid end-to-end, it would stretch more than the distance from Seattle to Portland, Ore.
- 7. Duct work:** WTP requires 2,100 tons of duct work and contains ducts that measure up to 5 feet in diameter. ■



WTP requires 41,000 tons of structural steel.

WRPS Releases Plan to **IMPROVE** **CHEMICAL VAPORS** Management

WRPS has released a comprehensive implementation plan to address recent chemical vapor exposure concerns and further improve worker safety at Hanford's tank farms.

The plan was developed in response to recommendations by an expert panel in its *Hanford Tank Vapor Assessment Report* released in October 2014 that aim to reduce potential chemical vapor exposure to workers. The implementation plan specifically addresses these recommendations by identifying activities to be carried out over the coming months and years.

“We are continuously improving the worker protection programs at Hanford's tank farms,” said Dave Olson, president and project manager for WRPS. “Using the recommendations from the report, we developed specific actions we plan to implement in a sustained, multi-year, two-phased effort to further protect workers from potential exposure to chemical vapors. This plan represents a clear commitment to make that happen.”

Planned actions include improving sampling and detection technology, expanding sampling and characterization of the tank head space gases, increasing real-time monitoring, and evaluation and deployment of new abatement technologies.

A number of actions called for in the report and outlined in the plan have already been implemented—including use of personal respiratory protective gear—and several others are underway as part of the first phase.

A WRPS project team will lead the implementation of actions outlined in the plan. Depending on information gathered and evaluated after the first phase, second-phase actions, costs, and schedules will be reviewed and, as needed, revised to reflect any new technical basis, as well as the ongoing incorporation of new technology and/or findings from research and development activities.

Additionally, the DOE announced the formation of an expert panel to provide independent assurance that actions identified in the plan are effective in protecting workers from potential exposures.

WRPS' Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations was released in February.



“We are confident that the steps outlined in this plan will improve the environment where we work and move us toward the next generation of tank farms where potential exposure to chemical vapors is further reduced.”

Dave Olson, president and project manager for WRPS

Read the full implementation plan by clicking [here](#). ■

WCH Reaches **5 MILLION SAFE HOURS**

For the second time since beginning work on the River Corridor Closure Project in 2005, Washington Closure and subcontractor employees have reached 5 million hours without a lost workday due to injury.

“This achievement of reaching 5 million safe hours is a tribute to our highly skilled workers. They have been consistent in demonstrating their commitment to safety while tackling hazardous and uncertain conditions on a daily basis,” said Scott Sax, president and project manager for Washington Closure.

In 2014 alone, Washington Closure completed several complex cleanup projects, including the removal of an underground test reactor and a concrete vault used to store highly contaminated liquid waste. Each lift was approximately 1,100 tons, or 2.2 million pounds, and required months of detailed preparation activities. In addition, team members have isolated unexploded ordnance from a former Hanford firing range; excavated



Workers remove cone penetrometers (CPTs) from around a Vertical Pipe Unit at the 618-10 Burial Ground. There are four CPTs around each of the 94 VPUs.

chromium-contaminated waste sites 85 feet deep, and transported 1.2 million tons of contaminated material away from the Columbia River to the site landfill – also managed by the Washington Closure team.

“We’re very proud of the strong safety culture our team has built over the past nine years and of the recognition we have received,” Sax said. “But we remain diligent and will continuously strive to enhance our safety culture as we complete our honorable mission with pride on the River Corridor.” ■



Excavation was completed at the 95-foot-deep 100-D Chromium Waste site where filling work has begun.

Historical DECONTAMINATION CELL Excavated at 618-10

A unique discovery was uncovered at the 618-10 Burial Ground trenches. A historical decontamination cell, weighing over 22,000 pounds from Hanford's 327 building, was excavated on November 3, 2014.

The decontamination cell was built in 1948 and was replaced by a newer model in 1960. The original cell was then disposed of at the 618-10 Burial Ground. It was of little use due to improper drainage, lack of exhaust control, and inadequate material handling equipment. It was used to decontaminate tongs, casks, and other related tools before being placed back into service.

In June 2009, an Integrated Chemical and Radiological Hazard Evaluation Worksheet, that was based on a review of historical documents was prepared for the 618-10 Burial Ground. "The worksheet stated we could possibly find an entire decontamination cell from the 327 Radiometallurgy Laboratory," said John Ludowise, 618-10 Project Engineer for trenches. "We just didn't know how accurate the supporting historical documentation would be."

Historical documents listed the original decontamination cell as being buried in pit 11 at the burial ground, which is close to where workers excavated it. The discovery came as a surprise because many of the historical documents reviewed to determine the location of items during excavation have not been accurate.

"Anomalies and unknowns are things we deal with every day," said Dave Martin, 618-10 Burial Ground Project Manager. "We have a highly trained workforce who is dealing with hazardous waste sites and facilities and they are getting their work done safely." Workers at the burial ground take pride in safely cleaning up the cold war legacy and protecting the river. "If we don't stay safe, we don't get work done."



Historic photo of the decontamination cell from Hanford's 327 Radiometallurgy Laboratory.

Planning for proper disposal of the decontamination cell is currently under way. Workers will take radiological measurements, develop a waste profile, wrap the decontamination cell in plastic, lift the cell with a crane onto a flatbed truck, and safely transport it to ERDF for disposal. The 618-10 Burial Ground is located six miles north of Richland, and just off of the main highway used by many to commute to and from work. ■



A historical decontamination cell from Hanford's 327 Radiometallurgy Laboratory was recently uncovered at the 618-10 Burial Ground.

2015 Hanford Site Tours

The Department of Energy is once again hosting two public tour programs in 2015. The tours began in April and run through August.

Hanford Site Public Tours

This driving tour of the site focuses on cleanup projects and includes a stop at the historic B Reactor. For these tours, participants must be U.S. citizens and at least 18 years of age. All tour slots are filled on a first-come, first-served basis through the online registration system at www.hanford.gov. There are 40 tours during the season.

B Reactor/Hanford History Tours

The tours provide visitors with both guided tour and exploration time at the B Reactor National Historic Landmark, and immerse visitors in the history of the Hanford Site prior to and during World War II. B Reactor is set to become part of the new Manhattan Project National Historical Park designated by Congress in 2014.

Visitors return to Richland via the Hanford Site river road. The bus will pass the old town sites of White Bluffs and Hanford, where most of the original residents of this area lived prior to World War II. Historic facilities including the old Hanford High School and White Bluffs Bank may also become part of the new National Park site at Hanford.

Tour slots are available on a first-come, first-served basis through an online registration system at <http://manhattanprojectbreactor.hanford.gov>, or by calling 509-376-1647 or stopping by the B Reactor Tour Headquarters.

If a tour should fill up online, check back frequently due to cancellations, especially within two weeks of the scheduled tour. That's when people generally cancel their seats as plans change. ■

At the Environmental Restoration Disposal Facility, visitors get to see how low-level waste is disposed of on the Hanford Site.

