

# HANFORD FORWARD

CENTRAL PLATEAU

**Demolition Nearing For  
Plutonium Finishing Plant**

RIVER CORRIDOR

**A Dynamic Ecosystem for a  
Wildlife Habitat Developed**

TANKS

**Bechtel Using Remote Computing  
for Innovation at Waste Treatment Plant**

**HANFORD'S  
ONE-OF-A-KIND  
LANDFILL  
CELEBRATES  
20 YEARS  
OF SERVICE**



**SUMMER 2016 ISSUE**

QUARTERLY PUBLICATION COVERING  
HANFORD CLEANUP NEWS & PROGRESS



# ABOUT HANFORD



**RICHLAND OPERATIONS OFFICE**  
United States Department of Energy

The Richland Operations Office is responsible for cleanup of much of Hanford's waste, including preparing and demolishing the Plutonium Finishing Plant, disposing of contaminated soil and solid waste, and treating groundwater, while providing occupational medical services and configuring site infrastructure for the future.



CH2M HILL Plateau Remediation Company (CH2M) is the prime contractor for the safe, environmental cleanup of the Central Plateau. CH2M's responsibilities include waste retrieval and fuels management, groundwater remediation and demolition of facilities and canyons, and closure of the Plutonium Finishing Plant.



HPMC Occupational Medical Services provides occupational medical services to the Department of Energy and to Hanford employees.



Mission Support Alliance (MSA) is responsible for integrated infrastructure services for the Hanford cleanup mission, including roads and transportation services; electrical and water services; facility maintenance; emergency response (fire and patrol) services; network and software engineering as well as environmental compliance and clean energy solutions.



Washington Closure Hanford (WCH) is responsible for cleaning up waste sites, decontaminating and decommissioning former plutonium production nuclear reactors and surplus facilities, and disposing of contaminated material. WCH is on schedule to complete its mission for the Department of Energy's Richland Operations Office Sept. 2016.



OFFICE OF RIVER PROTECTION  
United States Department of Energy

The Office of River Protection is responsible for the retrieval, treatment, and disposal of Hanford's tank waste in a safe, efficient manner. The River Protection Project is the largest and most complex environmental remediation project in the nation.



Bechtel National Inc. is responsible for designing, building and commissioning the world's largest radioactive and chemical waste treatment plant. When completed, the plant will be used to solidify the radioactive liquid waste stored in 177 aging underground tanks using a process called vitrification.



Washington River Protection Solutions is responsible for storing and retrieving the approximately 56 million gallons of nuclear and chemical waste stored in Hanford's tanks.



Wastren Advantage, Inc. is the prime contractor responsible for managing the 222-S Laboratory.

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# HANFORD'S ONE-OF-A-KIND LANDFILL CELEBRATES 20 YEARS OF SERVICE



*Scott Sax, Washington Closure Hanford President, addresses workers, stakeholders and Hanford officials at an onsite event to celebrate the Environmental Restoration Disposal Facility 20<sup>th</sup> anniversary.*

## The U.S. Department of Energy's Richland Operations Office and Washington Closure Hanford celebrated the 20<sup>th</sup> anniversary of the Environmental Restoration Disposal Facility in July at the massive landfill.

Scott Sax, president of contractor Washington Closure Hanford (WCH), joined Doug Shoop, manager of the Department of Energy's (DOE) Richland Operations Office, and Dave Einan from the Environmental Protection Agency (EPA), in praising the efforts of all employees—past and present—who have made Hanford's Environmental Restoration Disposal Facility (ERDF) so successful.

"Our success is a direct reflection of the people who've worked on the project over the decades," Sax said. "People who kept their safety and the safety of others always in front of them. People who offered and implemented new ideas and approaches to getting work done more efficiently. Everyone's contribution mattered, and it still does."

ERDF, often called the "Hub of Hanford Cleanup," began disposal operations in July 1996. Thanks to its safety-conscious workforce, the facility has achieved many remarkable cleanup milestones:

- Workers have safely disposed of almost 18 million tons of contaminated soil, debris and solid wastes from cleanup activities across the Hanford Site.
- Operations have supported the demolition of more than 800 facilities and remediation of 1,300 waste sites.
- Waste transport drivers have logged nearly 30 million safe miles – the equivalent of 1,200 trips around the world.



**“IF THAT LANDFILL WERE NOT AVAILABLE, TAXPAYERS WOULD HAVE HAD TO SPEND MILLIONS, IF NOT BILLIONS, OF DOLLARS TO SHIP THE WASTE IT HOLDS OFF SITE.”**

**– Doug Shoop, Manager,  
DOE's Richland Operations Office**



*The U.S. Department of Energy Richland Operations Office and River Corridor contractor Washington Closure Hanford held an onsite event to celebrate the Environmental Restoration Disposal Facility's 20<sup>th</sup> anniversary.*



*Doug Shoop, Manager, DOE's Richland Operations Office, addresses workers, stakeholders and Hanford officials at an onsite event to celebrate the Environmental Restoration Disposal Facility 20<sup>th</sup> anniversary.*

The majority of the waste material disposed at ERDF – about 16 million tons – was generated in Hanford's River Corridor, a 220-square-mile section of the Site that borders the Columbia River. The River Corridor was home to nine plutonium production reactors, fuel development facilities and hundreds of support structures and is DOE's largest environmental cleanup closure project.

“If that landfill were not available, taxpayers would have had to spend millions, if not billions, of dollars to ship the waste it holds off site,” Shoop told a crowd that included ERDF workers, stakeholders and Hanford officials.

Shoop also talked about how the existence of ERDF allowed for cleanup to progress along the Columbia River, which led to a new national park, how tribes are able to again spend time on their historic lands, and the public is starting to discuss public use of the land for outdoor activities.

EPA's Einan said if it were not for ERDF, decisions likely would have been made to leave more waste in the ground across the Hanford Site and build caps over the contaminated areas.

“I believe ERDF is a national treasure,” Sax said. “I'm proud of this team and its performance at ERDF, and I'm confident that same level of worker dedication to safety and performance will continue as ERDF operation transitions to CH2M Hill.” \* ❄️



# DEMOLITION NEARING FOR PLUTONIUM FINISHING PLANT

Hanford's Plutonium Finishing Plant (PFP) is the largest, most complex plutonium facility to have ever been remediated or demolished in the Department of Energy's (DOE) Environmental Management complex. Finally, after years of removing glove boxes, piping and contamination in preparation, PFP is about to come down.

## Safety Measures Lead to Progress

Over the past year, crews completed some of the most hazardous demolition preparations. To ensure worker safety during these activities, DOE and contractor CH2M HILL Plateau Remediation Company (CH2M) reconfigured work teams and resequenced high-hazard work, resulting in stronger safety performance and significant progress. Under the new protocol, the crews performed only one requiring pressurized Level B suits at a time. The suits keep workers safe while working in extremely hazardous environments.

"We've shown we can improve both safety and performance," said Tom Bratvold, vice president of the PFP closure project for CH2M. "Our workforce is motivated, dedicated and working together to keep each other safe. They're making tremendous progress on this challenging project."

*A crane lowers a glove box from the Plutonium Finishing Plant into a waste container for eventual disposal. While most of the facility's 238 glove boxes have been removed, a few will remain, protected from debris, and be removed during demolition.*



Employees wearing Level B suits remove pipe from building 242-Z. Work inside 242-Z is expected to be the last task at the plant requiring Level B suits.

This shows the Plutonium Finishing Plant complex. Demolition will start with 236-Z (green), progress to 242-Z (red), then 234-5Z (blue) and finally to 291-Z (yellow), the fan house and ventilation stack.

Work inside the Americium Recovery Facility (building 242-Z) is anticipated to be the last work at the plant involving Level B suits. The prospect of no longer needing the suits signals that the workers have significantly reduced the hazards at PFP.

Workers recently finished preparing the chemical tanks in building 242-Z for removal during demolition. They also finished preparing the facility itself for demolition by removing and packaging waste and painting the room to seal contamination in place.

In the building 234-5Z, the main PFP building, workers removed or prepared for removal during demolition, all 198 glove boxes, including two glove boxes so highly contaminated that workers had to wear special protective equipment as they cut up the glove boxes and removed them piece by piece. Workers also removed more than half of the 8,800 feet of contaminated ducting that supplied ventilation in the building and more than half of about 7,100 feet of contaminated process vacuum lines.

At the Plutonium Reclamation Facility (building 236-Z), workers removed all 52 contaminated processing tanks from the isolated canyon area. They are in the final stages of preparing the canyon and adjoining rooms for demolition.

### What Comes Next?

While demolition preparations continue inside the facility, crews outside are removing small buildings and other interferences to create a zone for heavy equipment to safely operate during demolition.

The project will conduct a readiness assessment, where a team of experts in nuclear operations, nuclear safety, emergency preparedness, radiological control, demolition, training, work control and related core disciplines review demolition

preparation and planning. Representatives from DOE and the Defense Nuclear Facilities Safety Board will observe the review.

236-Z will be the first building demolished, with demolition scheduled to begin in the coming weeks. Buildings 242-Z and finally 234-5Z will follow. Overall, demolition is expected to take less than a year – with the focus on performing the work safely.

“We’ve come so far on this historic project because of our commitment to working safely and watching out for each other,” Bratvold said. “No matter where we end up next, we will likely never have the chance to be a part of something as challenging, memorable and important as removing the PFP complex.” ✱

**“WE’VE COME SO FAR ON THIS HISTORIC PROJECT BECAUSE OF OUR COMMITMENT TO WORKING SAFELY AND WATCHING OUT FOR EACH OTHER.”**

– Tom Bratvold, CH2M Hill Plateau Remediation Company vice president of the Plutonium Finishing Plant Closure Project



# HANFORD FIREFIGHTERS

## Prevent **WILDFIRE** From Reaching Operations Area of Hanford



Hanford firefighters and workers helped prevent a wildland fire that started 40 miles west of the site from reaching operating areas of the Hanford Site. The firefighters took on the responsibility of a high-risk strategy of back-burning and effectively controlled the back-burn and connected it with a similar effort further to the north, which prevented the wildland fire from further spreading. Their success is attributed to the joint effort of firefighters,



teamsters, equipment operators, fleet management and support staff from infrastructure services contractor Mission Support Alliance. Overall the fire burned over 175,000 acres in central Washington. \*



# MILES OF HANFORD SITE LAND NEAR RIVER RESTORED

DURING PLANTING SEASONS



The Department of Energy’s (DOE) Richland Operations Office and contractor Washington Closure Hanford (WCH) have cleaned, backfilled and planted native vegetation on hundreds of former waste sites along the Columbia River in the past decade.

DOE and WCH recently finished backfilling more than 3 million tons of clean material to complete cleanup near three former plutonium production reactors. The most recent projects, which took place at the D, DR, and H reactor areas, included converting a former gravel pit into a wetland area.

Workers have finished the annual restoration and planting season that started in November 2015. They planted nearly 250 acres with 130,000 shrubs and approximately 7,000 pounds of native seeds — a visible sign of cleanup progress along the river that runs through the 580-square-mile site. Since 2005, the team has planted 2,150 acres with more than one million shrubs, 56,000 pounds of seed and 4,000 trees.

WCH also found a way to make backfilled areas look more natural, while also reducing project costs. “As part of

restoration and planting efforts, we incorporated recontouring, which included placing boulders and other natural materials to provide a dynamic ecosystem for wildlife habitat,” said Jeff Lerch, WCH environmental manager. “By doing so, we were

able to promote a more natural looking and sustainable habitat for wildlife and save taxpayer money.”

At the N Reactor area, the team reduced the amount of backfill material needed by not filling excavations to the surface level of the surrounding landscape. By contouring these locations, the restored area looks more natural and provides valuable habitat for wildlife. This restoration approach, used at many large areas, benefits birds and other animals.

“I’m extremely proud of our team and the work they have done to restore the environment along

the river,” said Lerch. “I grew up in this community and I am honored to have been a part of the team that is restoring the area along the Columbia River so that it can be enjoyed and used safely by future generations.” \*

**“I’M EXTREMELY PROUD OF OUR TEAM AND THE WORK THEY HAVE DONE TO RESTORE THE ENVIRONMENT ALONG THE RIVER.”**

**– Jeff Lerch, WCH Environmental Manager**



## 222-S LABORATORY UPGRADES WILL HELP ACHIEVE TANK FARMS MISSION

*Ventilation is key to controlling radiological conditions in the 222-S Laboratory.*

**The Department of Energy is funding facility upgrades in fiscal year 2016 and is considering additional upgrades for 2017 and 2018 to help keep the 222-S Laboratory operating until at least 2047. At that point, the facility will be nearly 100 years old.**

“We can’t afford to defer upgrades,” says Don Hardy, 222-S Laboratory manager. “Meeting the mission requirements requires every square inch of lab space.”

The 70,000-square-foot laboratory complex in the 200 West Area opened in 1951 as the process control laboratory for the Reduction-Oxidation (REDOX) Facility used for plutonium separation. The 222-S Laboratory’s 11 hot cells enable it to remotely handle samples of high-level radioactive tank waste while minimizing radiation dose to workers. The lab provides a full range of inorganic, organic and radiochemical analyses; develops analytical methods and tests process technology.

The American Recovery and Reinvestment Act authorized more than \$32 million from 2009 to 2011 to upgrade the 222-S Laboratory. Department of Energy (DOE) used the funds

to repair or replace failing infrastructure and installed new analytical equipment. A 10,000-square-foot, climate-controlled storage facility, along with a 17,000-square-foot administration building, were built.

Other planned upgrades include replacing the freight elevator and high-efficiency particulate air filters and designing upgrades to the 219-S facility.

Today, facility upgrades are continuing to extend the laboratory’s life and prepare it to support the Direct Feed of Low-Activity Waste (DFLAW) Project, which is key to completing the tank farms mission. The 222-S Laboratory will test waste delivered to the low-activity waste (LAW) vitrification facility at the Waste Treatment Plant (WTP) to ensure it meets the WTP waste-acceptance criteria. The lab also will be used to analyze

**“THE 222-S LABORATORY IS ONE OF THE LAST OPERATING NUCLEAR FACILITIES AT HANFORD. WITH A SIGNIFICANT INVESTMENT IN UPGRADES, IT WILL CONTINUE TO OPERATE FOR DECADES TO COME.”**

**– Don Hardy, 222-S Laboratory Manager**

the secondary waste stream returning from the WTP to the tank farms. It also may be designated the product laboratory that certifies the vitrified-glass LAW waste form as meeting regulatory requirements.

Laboratory rooms are being renovated at the rate of about two per year. Renovations include replacing fume hoods, some of which are original to the vintage laboratory, and ensuring that the lab can meet changing mission requirements.

“As the lab ages, maintenance costs continue to go up. And the older the facility gets, the bigger our maintenance challenge,” says Hardy. “It all comes down to risk management. If the laboratory can’t meet the demands, we put the tank farms mission at risk.”

### Ventilation is Key

With 150 fume hoods and 11 hot cells, ventilation is key to controlling radiological conditions in the laboratory. The ventilation system has three electric fans, each of which moves about 75,000 cubic feet per minute of air. A diesel-driven backup fan will maintain ventilation if the two outside electricity sources are lost. Upgrades under way include installing new capacitor banks and a diesel engine that meets current emission standards.

Dampers in the ventilation ducts are used to control the air flow and balance the system. Future upgrades will include new transformers and variable-speed fan motors to help further control the air flow. This will increase the system’s efficiency and help resolve a major maintenance issue with adjusting and maintaining the dampers.

### New Standards Lab being designed

A new 8,700 square-foot cold laboratory is being designed to replace the 222-SA Standards Laboratory that was demolished

last year. The design, now at 30 percent, will be completed in Fiscal Year 2016, with construction scheduled to be finished in 2018.

“The new laboratory is important for us because it will move ‘cold’ work outside 222-S, freeing up lab space for additional radioactive work,” says Hardy.

The cold laboratory will receive samples for analyzing organic vapors. It will also house the process chemistry lab for cold simulants in support of waste retrieval and the standards lab that develops standard reference material to check lab processes.

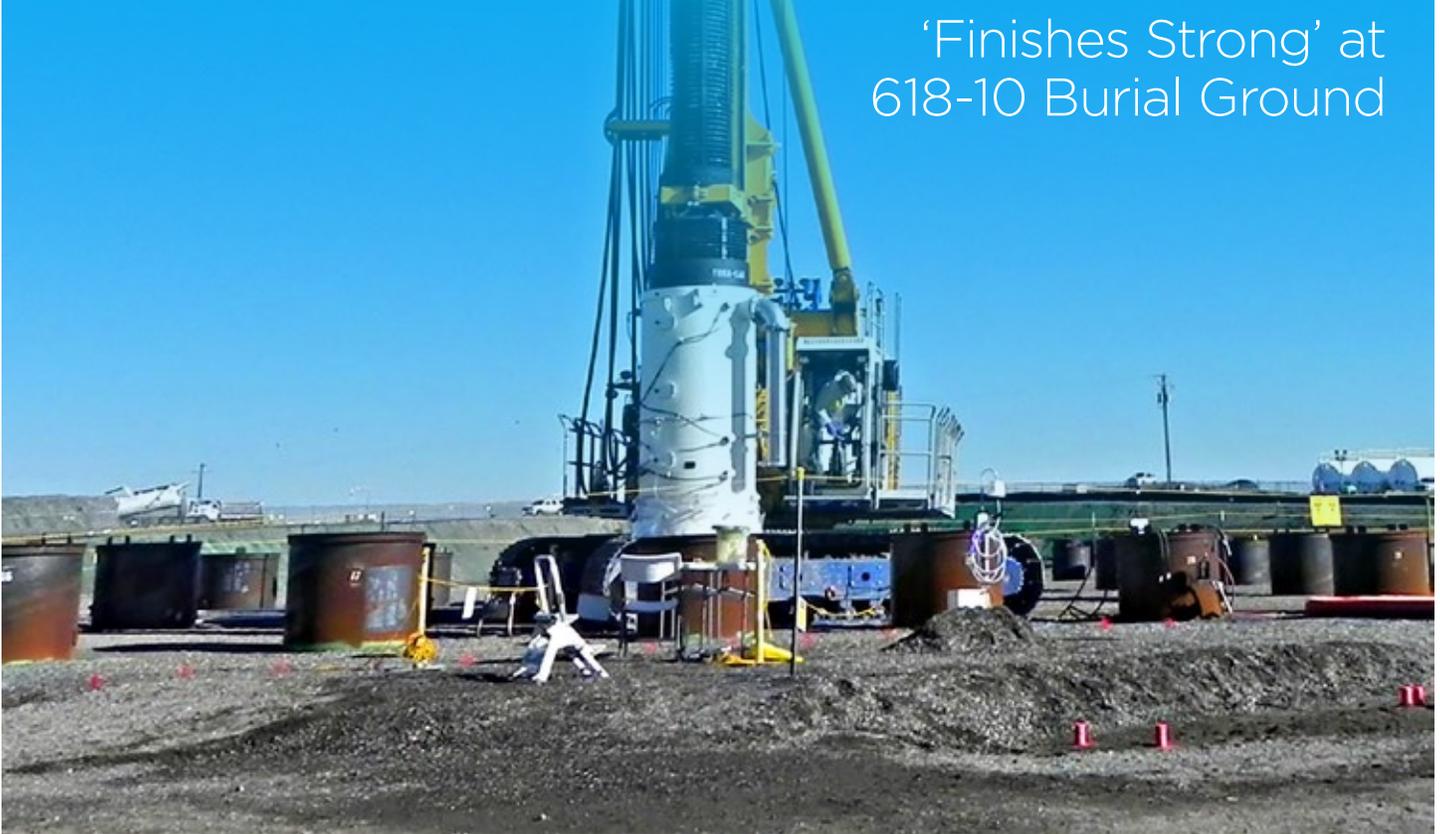
“It’s great to be part of an organization that plays such a critical role in the Hanford cleanup mission,” says Hardy. “The 222-S Laboratory is one of the last operating nuclear facilities at Hanford. With a significant investment in upgrades, it will continue to operate for decades to come.”

Washington River Protection Solutions operates the 222-S Laboratory. Another DOE contractor, Wastren Advantage, Inc., performs analytical services production functions at the laboratory. ✱



# WASHINGTON CLOSURE

‘Finishes Strong’ at  
618-10 Burial Ground



**Washington Closure Hanford President Scott Sax had a simple goal for his company during the final months of the River Corridor Closure Project. “Finish strong and finish with pride,” he repeatedly told his team.**

And that’s exactly what Washington Closure Hanford (WCH) has accomplished as the \$3 billion River Corridor Closure contract crosses the finish line after 11 years. Nowhere is it more evident than at the 618-10 Burial Ground, one of the most hazardous burial grounds in the Department of Energy (DOE) complex.

Cleanup of the burial ground includes remediating 94 buried vertical pipes units (VPU) that contain radioactive and chemical waste. The VPUs were constructed of either 55-gallon drums welded together end to end, corrugated pipes or solid steel pipes – all buried vertically. Some of the waste material disposed in the VPUs was packaged in a variety of containers that ranged in size from juice cans to paint buckets.

To remediate the VPUs, WCH used an auger to grind up the waste, piping material and soil within a steel overcasing, which allows the waste material to be safely retrieved, treated and

shipped to the Environmental Restoration Disposal Facility (ERDF) for permanent disposal.

As WCH prepares to transition the remaining work scope at the burial ground to CH2M Hill Plateau Remediation Company (CH2M) – DOE’s Plateau Remediation Contractor – in late August, it has completed augering 80 VPUs – the remaining 14 will be remediated by another method. DOE originally requested WCH to auger 28 of the VPUs and retrieve waste from 15 of them.

“It was like a hot knife through butter,” said Mark French, DOE Richland Operations Office director for the River Corridor. “It could not have gone any better.”

French said the augering process allows the VPUs to be broken open and the contents to react with the surrounding soils and moisture below grade, protecting the workers, environment and public. “It potentially saved millions of dollars by stabilizing the



waste as it was being augered, reducing extra steps that would have been required,” he said.

WCH began digging up the augered waste this spring, using a clamshell shovel lowered into the overcasing to bring up the waste and soil mixture, then deposit it in a nearby steel box to be mixed with grout for disposal at ERDF. Workers have loaded out the waste from about 30 of the 80 augered VPUs, with more completed each week.

Meanwhile, the project team has also been working to remediate the burial ground’s waste trenches. The team has removed about 1,900 of an estimated 2,000 drums, some of which are concrete-lined and contain high dose rate items. In addition, about 350,000 tons of waste material – mostly contaminated soil – have been safely transported and disposed at ERDF.

“The credit for our cleanup success at the 618-10 Burial Ground goes to our workers, who have been committed to working safely and efficiently since we began trench remediation activities in April 2011,” Sax said. “The burial ground is full of unknown hazards, which require careful, detailed planning and deliberate execution. I could not be more proud of the entire 618-10 project team and those who have supported the cleanup effort.”

CH2M will dig up the remaining waste from the VPUs augered by WCH and will remediate the remaining VPUs, which are made of thick-walled steel.

The 7.5-acre burial ground operated from 1954 to 1963. It received waste generated primarily from Hanford’s 300 Area, where fuel metallurgical analysis was performed and new methods were developed to separate plutonium from nuclear fuel. \*

**“IT WAS LIKE A HOT KNIFE THROUGH BUTTER. IT COULD NOT HAVE GONE ANY BETTER.”**

**– Mark French, DOE Richland Operations Office director for the River Corridor**



**ABOVE:** Workers process waste during trench remediation at the 618-10 Burial Ground.



**LEFT:** A drum is placed into a drum punch facility for characterization at the 618-10 Burial Ground. To date, approximately 1,700 drums have been excavated from the burial ground’s waste trenches.

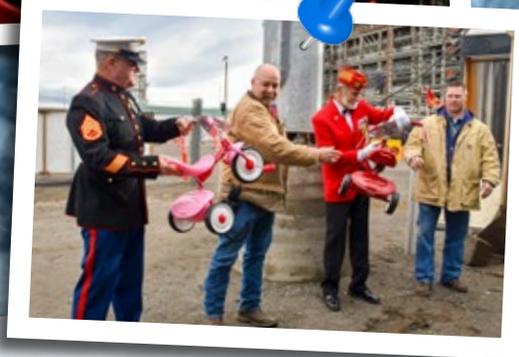


# HANFORD CONTRACTORS IN THE COMMUNITY



**“THE SUPPORT OF HANFORD CONTRACTORS HAS BEEN CRITICAL TO OUR SUCCESS AS AN ORGANIZATION. ANNUALLY, CONTRACTORS DONATE MORE THAN \$55,000 COMBINED TO HELP FUND PROGRAMS FOR MORE THAN 12,000 LOCAL STUDENTS.”**

— Susan Fillafer, Regional Director, Junior Achievement of Washington Southeastern Region



**CH2M HILL PLATEAU REMEDIATION COMPANY** presented **Friends of Badger Mountain** with a **\$100,000** donation toward their commitment to help purchase land, expand trails and create trail monuments to honor Hanford workers.



**WASHINGTON CLOSURE HANFORD** donated more than **800 pounds of food** and over **\$11,000** to the Second Harvest Feeding Families Food Drive in May 2015.



**MISSION SUPPORT ALLIANCE** was the Junior Achievement Bowl Top Corporate Fundraiser in 2016 – Employees raised over **\$30,000!** 17 employees also served as Junior Achievement classroom volunteers!



**BECHTEL NATIONAL, INC.**  
DONATED \$100,000  
to help Friends of Badger  
Mountain's fundraising campaign  
to buy more than 200 acres  
on Candy Mountain.



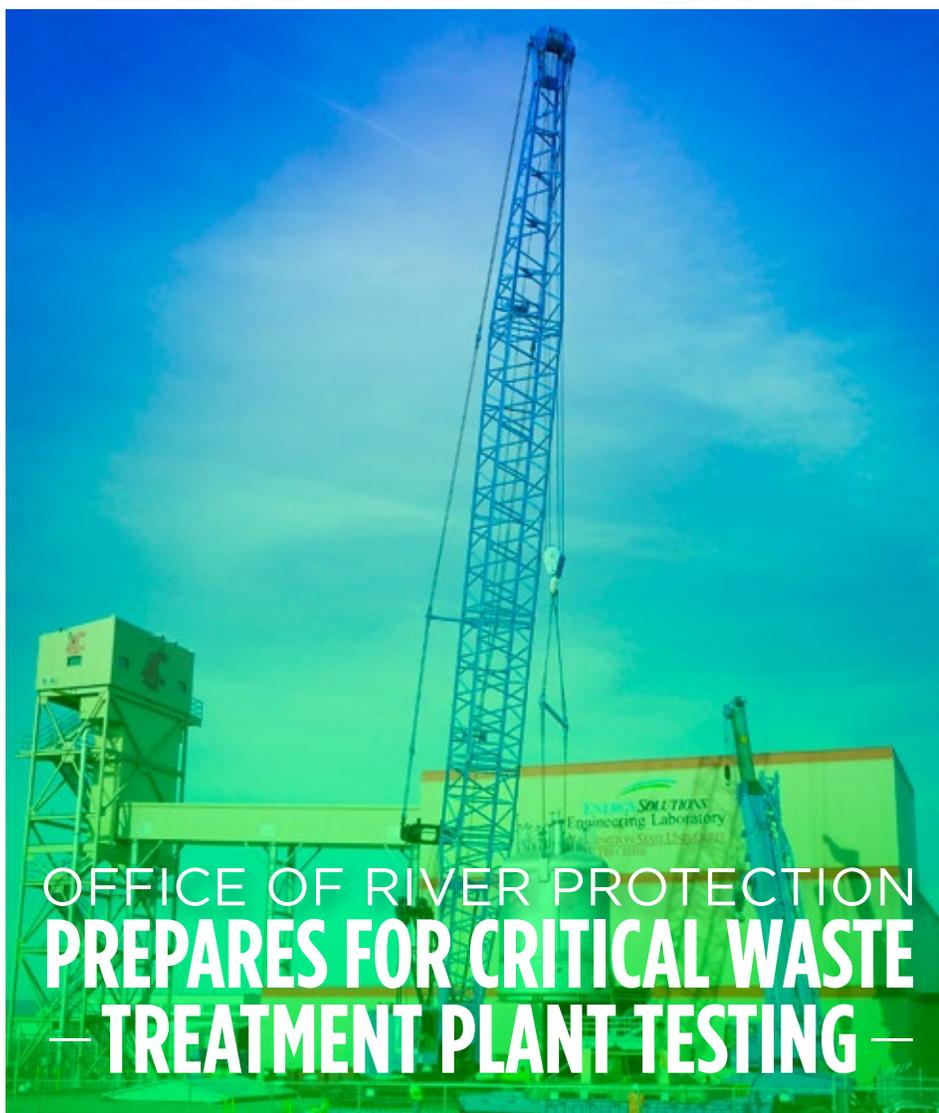
**MSA**  
has provided  
more than  
**\$550K**  
in college  
scholarships  
to local students  
since 2009!



Tri-City area students will benefit from  
**\$127,000** in contributions from  
**WASHINGTON RIVER PROTECTION SOLUTIONS.**  
The money will be used to strengthen  
and expand K-12, college and community  
science, technology, engineering and  
mathematics (STEM)-related programs.



**“HANFORD CONTRACTORS** make significant  
contributions, of both time and money, to community organizations  
such as **United Way, the Tri-Cities Cancer Center, Habitat for Humanity,**  
**the Children’s Developmental Center** and many more.”  
— GARY PETERSEN, VP OF FEDERAL PROGRAMS, TRIDEC



## OFFICE OF RIVER PROTECTION PREPARES FOR CRITICAL WASTE — TREATMENT PLANT TESTING —

**The Department of Energy's Office of River Protection removed a 30-ton stainless steel vessel to make way for a new one to fulfill a critical role in verifying design and performance of the Pretreatment Facility at the Waste Treatment and Immobilization Plant.**

The new 35-foot-high vessel, a full-size prototype, was delivered to the Department of Energy (DOE) Office of River Protection (ORP) earlier this summer. Waste Treatment Plant (WTP) employees are developing a test plan to support requirements verification. Test platform commissioning is expected to begin late this year.

Testing of the old 18-foot-tall vessel ended in December. Workers removed the vessel by connecting it to a crane and lifting it out of a skylight in the laboratory's roof.

The old vessel allowed WTP employees to demonstrate that pulse jet mixers planned for use in pretreatment would work with a range of radioactive waste mixes as anticipated.

"Our recently completed tests demonstrated we can consistently and reliably control these mixers," said Felice Presti, pretreatment area project manager. "We're looking forward to conducting the full-scale testing. Our goal is to construct a safe, effective facility to help treat waste and, ultimately, protect the Columbia River

and this community from Hanford waste."

The old vessel enabled ORP to capture data on how the computer controls outside the vessel worked to operate mixers inside the vessel under a variety of tank levels using simulated waste with a low amount of solids. Later tests showed how the mixers performed under a variety of slurry and tank-level conditions, from low to high amounts of solids, using simulants.

In 2012, the testing protocol for the mixers expanded to include studies with full-scale vessels. Previous plans relied on computational models and testing in smaller vessels.

Used in nuclear applications for mixing radioactive liquids, slurries, and sludge for more than 40 years, the mixers contain no moving parts and mix waste by expelling it with compressed air. They are refilled with waste by applying a vacuum pressure.

Vessel testing occurs at ORP's Full-Scale Vessel Test Facility, which houses testing programs for Hanford Site projects to help to ensure progress while reducing risk to workers and our environment.

WTP will be the world's largest radioactive nuclear waste vitrification facility and is being designed and constructed by ORP contractor Bechtel National Inc. When complete, it will vitrify most of the 56 million gallons of the country's most complex nuclear waste currently stored in tanks on the Hanford Site.

The largest of the four major WTP nuclear facilities, the Pretreatment Facility's interior waste feed receipt vessels will receive waste pumped from the Hanford tanks via underground pipes. In the first pretreatment phase, the waste will be concentrated using an evaporation process. Solids will be filtered out, and the remaining soluble, highly radioactive isotopes will be removed using an ion-exchange process. ✱



# WASHINGTON CLOSURE HANFORD REACHES 7 MILLION SAFE CONSECUTIVE WORK HOURS



Washington Closure Hanford (WCH) and its subcontractor employees reached a significant safety milestone this spring by working 7 million hours without a lost workday injury – that’s 3 ½ years since the last on-the-job injury that required an employee to spend time away from work.

WCH manages the \$2.9 billion River Corridor Closure Project, the largest environmental cleanup closure project, for the Department of Energy’s (DOE) Richland Operations Office. WCH’s work scope involves demolishing hundreds of contaminated buildings, remediating hundreds of waste sites and burial grounds, and managing the Environmental Restoration Disposal Facility (ERDF).

“This is a remarkable achievement for the entire River Corridor team,” said Scott Sax, WCH president and project manager. “Our employees have met the unique and hazardous challenges they face on a daily basis by placing safety and each other’s well-being above all else. I’m very proud to be a part of such a team.”

The River Corridor is a 220-square-mile section of the Hanford Site that borders the Columbia River and was the home

to Hanford’s nine plutonium production reactors and fuel development facilities and the hundreds of support structures that operated during World War II and the Cold War.

Since beginning cleanup work on the River Corridor in 2005, WCH has demolished 324 buildings, cleaned up 575 waste sites, disposed of 11.9 million tons of contaminated material in ERDF and placed two nuclear reactors in interim safe storage. By completing cleanup projects safely and efficiently, WCH has saved taxpayers money by coming in more than \$300 million

under budget. This enables WCH and DOE to reinvest the savings toward additional cleanup work.

Last October, DOE awarded WCH an additional year on its original

10-year contract to complete additional work. Since then, the company has focused mostly on two challenging projects. The first is cleaning up the highly hazardous 618-10 burial ground, which involves remediating buried vertical pipe units – some of which contain highly contaminated radioactive waste. The second is placing the 324 building in maintenance status for future demolition. \*

**“THIS IS A REMARKABLE ACHIEVEMENT FOR THE ENTIRE RIVER CORRIDOR TEAM.”**

– *Scott Sax, WCH president and project manager*

# EFFLUENT TREATMENT FACILITY RESTARTS OPERATIONS



Washington River Protection Solutions LLC (WRPS) began operating the Effluent Treatment Facility (ETF) on May 19, 2016, after having been shut down for slightly more than two years for repairs and upgrades. Kent Smith, Production Operations manager, praised the project team for its work to bring the facility back online.

So far, the plant has processed more than 2 million gallons of effluent since restarting.

“Congratulations to the ETF staff and everyone who contributed to the restart of the plant,” he said. “It’s been a long road full of challenges, but their hard work and dedication to the project will allow for safe and efficient operation of the facility for years to come.” He added that Department of Energy Office of River Protection (DOE-ORP) was “very complimentary” of the team’s efforts.

WRPS assumed management of ETF and its associated facilities – the Liquid Effluent Retention Facility (LERF) and the Treated Effluent Disposal Facility (TEDF) – in March 2015 after the DOE Richland Operations Office transferred responsibility for the facilities to the DOE-ORP. At the same time, about 45 workers moved from CH2M HILL Plateau Remediation Company to WRPS to support ETF.

WRPS spent a year completing facility upgrades, refining procedures and training personnel. The upgrades included installing a new 10,000-pound heat exchanger last spring. The

heat exchanger provides heat to evaporate excess water during the effluent treatment process. They also completed a significant modification to the ion exchange system’s chemical supply.

ETF, located in the 200 East Area, is used to remove radioactive and hazardous contaminants from waste water generated by 242-A Evaporator campaigns, groundwater projects, solid waste disposal facilities and other Hanford Site cleanup activities.

“The Effluent Treatment Facility is essential to managing our double-shell tank storage space and other Hanford disposal operations, as well as future operation of the Waste Treatment Plant,” said Jim Foster, manager of the 242-A Evaporator, AW tank farm and ETF operations.

ETF has primary and secondary treatment trains, each of which comprises a series of processes. The primary treatment train removes dangerous and mixed waste components from the waste water before sending the remaining water for disposal in the state-approved liquid disposal site. The secondary treatment train concentrates and dries the waste components into a powder, which is placed into drums and transported to the Environmental Restoration Disposal Facility.

LERF accepts and stores the waste water sent to ETF for treatment until ETF can treat it. LERF consists of three lined storage basins that can hold about 23 million gallons of waste water. ✱

# OFFICE OF RIVER PROTECTION SCIENTIST CONTRIBUTES TO COVER STORY ON GLASS STUDY

*Simulated low-activity waste is cooled in a prototypic steel container as part of ORP-sponsored testing at a Columbia, Md., facility in September 2003.*

Albert Kruger, a Department of Energy (DOE), Office of River Protection (ORP), glass scientist is one of six authors of “Ensuring longevity: Ancient glasses help predict durability of vitrified nuclear waste,” an in-depth cover story for the American Ceramic Society Bulletin. The article explains why researchers are studying ancient glass from a Swedish hillfort and other sources for insight into how vitrified nuclear waste will fare during centuries-long storage at the Hanford Site.

The article focuses on the challenging problem of determining how glass alters over time. Although ancient artifacts have compositions different from new glasses, it says, they offer many potential analogues for study. Better understanding of long-term glass alteration helps researchers more accurately predict the performance of vitrified nuclear waste to help develop durable waste glasses.

“The ability to benchmark waste-form performance against long-term, real-world behaviors offers an incredible advantage in our treatment and disposal programs,” Kruger said. “As we develop an accelerated aging test for our waste form, a measure of the

test’s validity will be that it predicts aging identical to that which we found in the hillfort glasses that have aged naturally over more than 1,500 years.”

ORP is collaborating with DOE’s Pacific Northwest National Laboratory, Washington State University (WSU), Luleå University in Sweden, and the Smithsonian Institution’s Museum Conservation Institute in the study of ancient glass — how it has fared through the centuries and how it compares to results of accelerated aging tests on various types of low-activity waste.

Funded by the DOE, Office of Environmental Management’s International Program, the study is part of a broader initiative to engage in mission-related research with

countries having common interests.

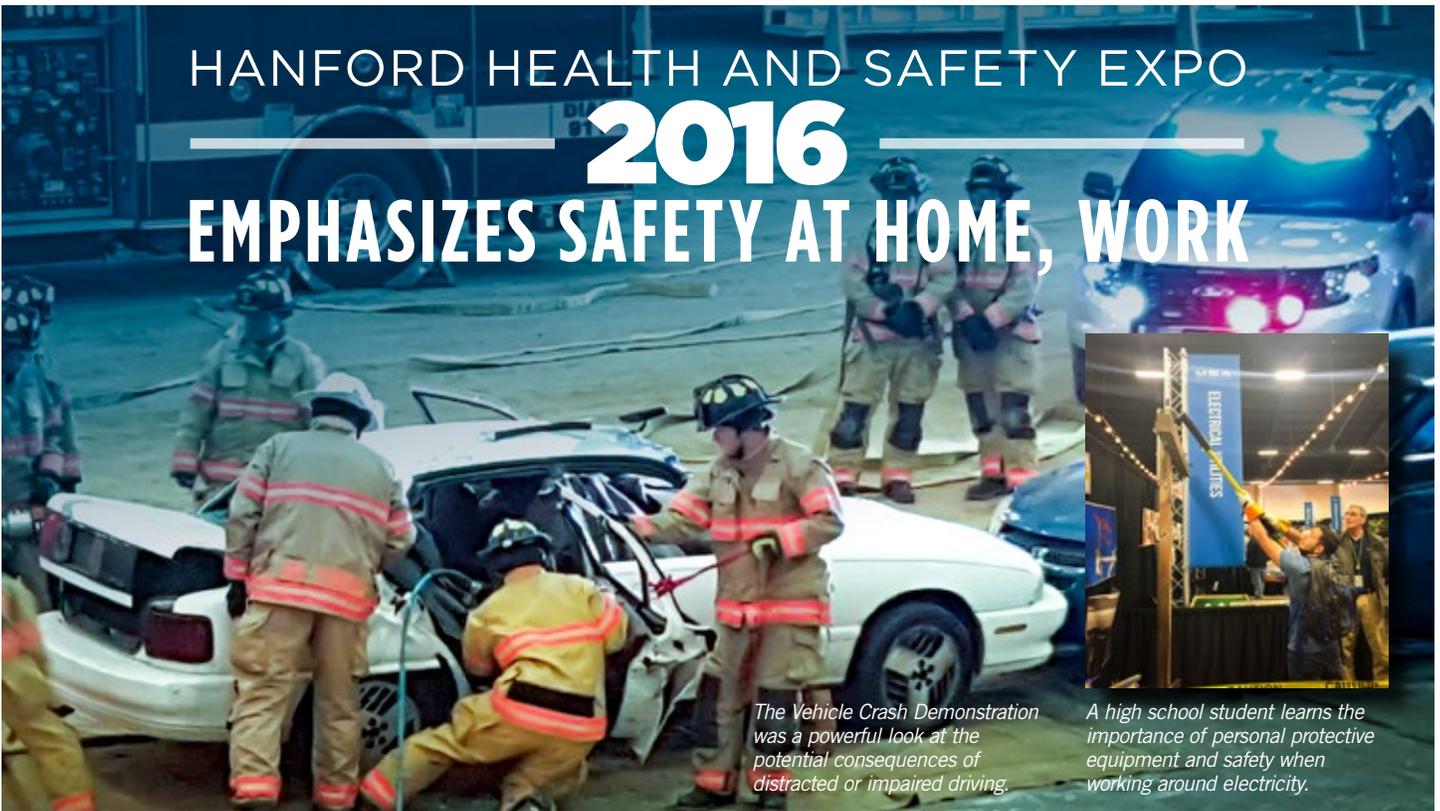
At ORP, workers are building the world’s largest radioactive waste treatment plant. When complete, the Waste Treatment and Immobilization Plant will process and stabilize 56 million gallons of radioactive and chemical waste currently stored at the Hanford Site. The waste will be immobilized in glass through vitrification. ✱

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**– Albert Kruger, a Department of Energy (DOE), Office of River Protection (ORP)**



# HANFORD HEALTH AND SAFETY EXPO 2016 EMPHASIZES SAFETY AT HOME, WORK



*The Vehicle Crash Demonstration was a powerful look at the potential consequences of distracted or impaired driving.*

*A high school student learns the importance of personal protective equipment and safety when working around electricity.*

**At the Hanford Site, the commitment to safety extends beyond workers and the job site to the community. Promoting the overall importance of health and safety at both home and work was the focus of EXPO 2016, the health & safety exposition, held in Pasco, Washington, May 10 and 11.**

With an average annual attendance of nearly 40,000, EXPO reaches a large cross-section of the community. This year, they added a theme emphasizing science, technology, engineering and mathematics (STEM) education and its relationship to health and safety.

“Completing work safely is the top priority at the Hanford Site, and EXPO allows us to bring increased awareness of the significance of health and safety to the entire community,” said Stacy Charboneau, Associate Principal Deputy Assistant Secretary for Field Operations, Department of Energy – Environmental Management. “The EXPO highlights the work Hanford employees carry out every day using good safety techniques and equipment.”

Participants agree that EXPO is a great opportunity to share their safety knowledge with Hanford Site coworkers and the surrounding community. Owen Berglund, with Hanford contractor Washington River Protection Solutions, has been part of the EXPO committee since it began 22 years ago. To him, the EXPO exemplified the seriousness of incorporating safety into all aspects of life.

One of the most popular and powerful parts of EXPO 2016 was the Vehicle Crash Demonstration, a collaboration of local law enforcement agencies, the Hanford Fire Department, wrecking and towing companies and volunteer actors who demonstrated the potential consequences of impaired or distracted driving.

“Knowing that it’s a demo and not real doesn’t diminish how compelling and impactful it is. As a young adult, I know many people who engage in unsafe driving. Participating in a crash demonstration as the ‘victim’ has changed the way I drive,” said Clayton Simundson, a Hanford contractor Mission Support Alliance intern who has helped with the crash demonstration for the past two years.

In addition to the major Hanford contractors, more than 150 regional health and safety vendors and exhibitors took part in EXPO 2016. Many of their booths featured interactive demonstrations and hands-on activities. Highlights included Casper the inflatable colon and MEGA Lungs. Attendees who walked through these interactive exhibits learned about colon cancer and lung disease and their prevention. Another popular event was the bicycle rodeo where children could learn safe ridership skills. \*



## BECHTEL USING REMOTE COMPUTING FOR INNOVATION AT WTP

*During a recent field visit, Jared Thomas (left) was able to discuss recent drawings and 3D models using his tablet.*

Jared Thomas has been hard to find at his desk lately. And that's a good thing. Thanks to recent deployment of hybrid tablets, the Bechtel National, Inc., field engineer spends most of his time at the Department of Energy's Office of River Protection Waste Treatment and Immobilization Plant construction site.

"Anything I was doing on my desk workstation I can now do in the field," Thomas said. "As a field engineer, spending more time with my crew allows me to be more efficient in doing my work, more proactive in identifying issues and more accessible to answer questions."

With hybrid tablet in hand, Thomas submits and signs inspection records, generates field changes and documents corrective actions on the spot. He saves printing costs by pulling up the latest documents, drawings and 3D models electronically. Instant access to the Waste Treatment Plant (WTP) network ensures quality by allowing him to always pull up the most current revisions.

He also is connected instantly to coworkers via webcam and instant messaging. By firing up the front- or rear-facing camera, Thomas can have real-time discussions with project employees in Richland, WA; Reston, VA; or San Francisco, CA.

The device functions as a standalone tablet with full touch interface or, with a detachable keyboard, as a laptop. It also can serve as a desktop workstation using wireless docking to connect a keyboard and dual monitor setup.

The tablets allow hundreds of WTP engineers, like Thomas, to perform their work from any safe, Wi-Fi-enabled location

at the 65-acre construction site. The flexibility is saving time, increasing efficiency and improving quality at the massive construction project.

WTP management had been searching for a way to equip employees with a single remote-computing device powerful enough to fully integrate critical project software and secure enough to operate within stringent Department of Energy (DOE) and Bechtel security protocols.

"I am encouraged to see cutting-edge technology being applied to the construction of WTP," said Bill Hamel, DOE Office of River Protection assistant manager for the WTP Project.

The technology has inspired field engineers to innovate further. Emergent capabilities involving electronic forms, automated reporting and using 360-degree video are enhancing quality and task efficiency.

"The time and budget resources applied to automation will promote efficient execution of the WTP mission, which will bring us closer to treating Hanford's tank waste," said Mike Costas, Bechtel's manager of quality and functions at the WTP Project. "Clearly, innovation within WTP construction is on course." \*