PANEL SESSION 11 – US DOE Featured Site: Hanford – Accomplishments and Challenges

Co-Chairs: Dave Brockman, Manager, *Richland Operations Office, U.S. DOE*;
Stacy Charboneau, *Assistant Manager for Tank Farms Project, Office of River Protection, U.S. DOE*
Panel Reporter: Todd Nelson, *Washington Closure Hanford*

Panelists included:

1. Dave Brockman, *Manager, Richland Operations Office, US DOE;*
2. Stacy Charboneau, *Assistant Manager for Tank Farms Project, Office of River Protection, US DOE;*
3. Frank Figueroa, *President and General Manager, Mission Support Alliance*;
4. Ryan Dodd, *Deputy Manager, Washington Closure Hanford;*
5. John Lehew, *President, CH2M Hill Plateau Remediation Company;*
6. Wayne Johnson, *Director Environmental Sustainability Division, Pacific Northwest National Laboratory;*
7. Greg Ashley, *WTP Project Technical Director, Bechtel National;*
8. Scott Saunders, *Manager, Technology and Single-Shell Tank Retrieval, Washington River Protection Solutions;*
9. Tom Brouns, *Manager, Environmental Health and Remediation Sector, Pacific Northwest National Laboratory*.

About 150 people attended the session. The panel session focused on the progress made in cleaning up Hanford, the U.S. Department of Energy's largest and longest-term nuclear waste cleanup project. In addition to an overview of current efforts, the panelists' presentations and discussion also focused on current cleanup challenges and the technologies used to address them.

Dave Brockman opened the session with introductions and a brief overview of the 586-square-mile Hanford Site, which is located in south-central Washington State. The site was established in 1943 to produce plutonium for the atomic bomb during World War II and later during the Cold War years. From 1943-1963, nine plutonium production reactors were built at Hanford. Additionally, five reprocessing facilities, 177 underground waste storage tanks were built, along with the facilities to support them and an average workforce of about 14,000 people. With the end of the Cold War in 1989 and Hanford's plutonium production mission, work shifted to cleanup of the wastes generated by nearly 50 years of plutonium production and processing.

There are two key cleanup activities underway at Hanford: cleanup of the River Corridor and the Central Plateau, managed by DOE's Richland Operations Office; and construction of the Waste Treatment Plant and emptying of radioactive liquids from the underground waste storage tanks, managed by DOE's Office of River Protection. In addition, DOE's Richland Operations Office has a Mission Support Contractor that provides infrastructure development and operation, and integrates the provision of those services across the Hanford Site. The key technical cleanup challenges for Hanford are the deep vadose zone, 618-10 & 11 Burial Grounds, five large canyon facilities, emptying of the single-shell tanks and design, construction and operation of the Waste

Treatment Plant. The major focus is on reducing the active footprint of cleanup from 586 square miles to about 10 square miles.

Stacy Charboneau provided an overview of the responsibilities of DOE's Office of River Protection. ORP is responsible for overseeing the construction of Hanford's vitrification facility, the Waste Treatment Plant, along with overseeing the work to transfer the liquid waste from Hanford's single-shell tanks into the double-shell tanks in preparation for the start of WTP operations in 2019. ORP is responsible for 177 underground storage tanks where more than 53 million gallons of radioactive and chemical wastes are awaiting treatment and disposal. The tanks include 149 leak-prone single-shelled tanks, many of which date back to the early days of the Manhattan Project and the Cold War era. Another 28 are newer, double-shelled tanks. The ORP mission is to reduce the risk from the wastes and safely manage them until they can be prepared for disposal.

Frank Figueroa provided an overview the responsibilities of the Mission Support Alliance, Hanford's newest prime contractor. MSA manages the Mission Support Contract for DOE's RL. MSA provides essential site services to DOE and its contractors at Hanford. Services include safety, security, environmental management; site infrastructure and utilities; site business management; information management; and portfolio management. MSA also manages the HAMMER training center, which provides site-wide training to Hanford Site contractors, as well as critical safety and security related training to other government agencies including the Department of Homeland Security. MSA also serves as DOE's "trusted agent" in the areas of project management and integration among contractors, life-cycle cleanup planning processes and other areas, including integrating missions for enhanced performance and accelerated cleanup.

Ryan Dodd provided an overview of the River Corridor Closure Project, which is in the fifth year of a 10-year, $2.4 billion project at Hanford to clean up 370 waste sites burial grounds; demolish 486 buildings; place three nuclear facilities including two nuclear reactors, into interim safe storage; and manage and expand as necessary the onsite disposal facility for Hanford cleanup wastes – the Environmental Restoration Disposal Facility. Hanford's River Corridor is 210 square miles and includes areas adjacent to the 50-mile segment of the Columbia River that runs through Hanford, as well as large portions of the Hanford Reach National Monument. Major challenges in the coming year include work at the 618-10 and 118-K-1 burial grounds, and D&D of the 324 and 327 buildings. Half way through the 10-year project, Washington Closure is 8.6 percent ahead of schedule and has saved $152 million in the process.

John Lehew manages the Plateau Remediation Contract for DOE. The cleanup scope of work for CH2M Hill Plateau Remediation Company includes remediation of two reactor complexes at the 100-K Area; closure of the Plutonium Finishing Plant; remediation of the groundwater and vadose zone; disposition of the five reprocessing canyons; retrieval, treatment and disposal of transuranic-contaminated material; and placing the Fast Flux Test Reactor into cold and dark conditions. In addition, at $1.3 billion in American Recovery and Reinvestment funding, CHPRC is the largest recipient of ARRA dollars. ARRA has provided an unprecedented opportunity to expand and train the workforce and accelerate cleanup across the Hanford Site. More than 1,200

jobs have been created or retained as a result of ARRA funding and more than $276 million in contracts have been placed with more than 63 percent going to small businesses.

Wayne Johnson discussed the Pacific Northwest National Laboratory's work to apply advanced science and technology solutions to some of Hanford's most pressing issues, specifically, innovations to transform subsurface remediation. With nearly a dozen contaminants contaminating over 100 square miles of Hanford's groundwater/vadose zone, PNNL is bringing strong science and computational core competencies to support resolution of complex subsurface issues. Researchers are looking at ways to use technology to immobilize, remove or convert hazardous waste to less toxic or mobile forms, especially in near-river environments. Hanford's complex geology, geochemistry and hydrology form the basis of some of the most complex environmental challenges anywhere in the DOE complex. PNNL science and innovations are helping to deliver transformational solutions for persistent soil and groundwater contamination and deep vadose zone remediation.

Greg Ashley provided an overview of the technologies being developed by Bechtel National, Inc., for the Waste Treatment Plant Project's Pretreatment Facility, the largest of the nuclear waste separations facilities on the Waste Treatment Plant Project complex. The purpose of the facility is to separate the high-level waste stream from the low-level waste stream. By minimizing the amount of material going into the HLW facility and the number of HLW canisters generated, overall costs of the project can be reduced and the waste can be processed more efficiently. Currently, they are testing confirmed processes for minimizing the HLW stream and incorporating the results into facility design.

Scott Saunders provided an update on technologies being used by Washington River Protection Solutions to retrieve and transfer waste from the older single-shell tanks into the newer double-shell tanks. The WRPS mission is to reduce risk from 53 million gallons of high-level radioactive waste stored in 177 underground tanks and prepare the waste for eventual treatment at the Waste Treatment Plant. Right now, efforts are focused on moving the waste out of the single-shell tanks into safer double-shell tanks to be staged for treatment and disposal. Sluicing can remove 90 percent of the material in the tanks, and then other approaches must be used. The goal is to deploy a single tool capable of completely emptying all tanks. Design of the Mobile Arm Retrieval System has been completed and successfully tested in the Cold Test Facility. It uses off-the-shelf technology as much as possible to save time and reduce costs. Installation in the first tank – C-107 – is scheduled for late 2010 with waste retrieval to begin in March 2011.

Tom Brouns described Pacific Northwest National Laboratory activities to support Hanford's waste treatment activities. The laboratory has a strong history in the development of nuclear fuels and materials, the chemistry of nuclear processing, as well as process development and scaling from bench to pilot to operational facilities. An example provided was in the area of Waste Treatment Plant leaching and filtration. The laboratory has done extensive characterization of a range of tank wastes, conducted laboratory-scale testing of the WTP process flow sheet with actual wastes and conducted engineering-scale testing with stimulant waste. A second example was the development of a technical basis and foundation for design and operation of the WTP slurry transport, piping and mixing system.

Questions from the audience included:

Q1. If you can oxidize waste in the tanks you won't have chromium as a choking point.
A1. We've looked at a number of technologies to accomplish that and are actively seeking others that might work.

Q2. Might it be necessary to build another double-shell tank to accelerate tank waste retrieval?
A2. That's a possibility. Another possibility is to get a RCRA waiver to use single-shell tanks as staging. We could build some sort of waste receiving facilities, which we will need anyway. We are continuing to assess our options.

Q3. WTP is making a product designed for Yucca Mountain. Any plans to change the design given the unavailability of Yucca?
A3. We have no plans to change the design from that for a national geologic waste repository.