

Oregon Hanford Cleanup Board

Best Western Plus, Cascade Locks, Oregon

Monday, January 25, 2016

Board Members in Attendance:

Mecal Seppalainen, Chair
John Howieson, Vice-Chair
Steve March
Dan Solitz
Lori Brogoitti
Dave Ripma
Ted Taylor
Bryan Wolfe
Glen Phillips
Ivan Gall (Oregon Water Resources Dept.)
Ken Niles (Oregon Department of Energy)
Rep. Greg Barreto

Oregon Department of Energy staff:

Mark Reese
Dirk Dunning
Dale Engstrom
Paul Shaffer

Tri-Party Agencies and Contractors:

U.S. Dept. of Energy, Office of River Protection
- J.D. Dowell
- Steve Pfaff
U.S. Department of Energy, Richland Office
- Stacy Charboneau
- Rich Buel
- Kris Holmes
CH2MHill Plateau Remediation Company
- Sonya Johnson
- Dale McKenney
Washington Department of Ecology
- Jane Hedges
- John Price
- Dieter Bohrman
U.S. Environmental Protection Agency
- Dennis Faulk

Public:

Katherine Bittinger
Paige Knight

Administrative

Chair Mecal Seppalainen opened the meeting at 1:05 p.m. and welcomed Board members and guests. She recognized new Board members Glen Phillips and Representative Greg Barreto.

Glen is the Operations Chief at the Hermiston Fire Department and our newest public safety Board member from Eastern Oregon. Glen was born and raised in Hermiston. He stated that he is familiar with Hanford and transuranic waste shipments because he also serves as the Coordinator for the Region 10 Hazardous Materials response team for the state. He is interested in becoming more involved with the Board and he hopes to be able to take a site tour soon.

Greg represents House District 58 in eastern Oregon. He was recently appointed to replace Representative Greg Smith on the Board. Greg lives in Cove, Oregon and owns a manufacturing

business. He indicated that he doesn't know a lot about Hanford, but he is here to learn and make a contribution to the Board.

The September Board meeting minutes were approved with several minor changes suggested by Mecal and Ted Taylor. Steve March moved to approve the minutes and Bryan Wolfe seconded the motion.

Mecal told the Board that she is stepping down as a Board representative to the Hanford Advisory Board (HAB). She would like to know if someone is interested in taking her spot. The Board agreed to hold the discussion until the second day of the meeting.

Review of Activities/Events Since September Meeting

Ken Niles, Oregon Department of Energy (ODOE), provided a review of relevant Hanford and Board-related activities since the Board's last meeting in September. He mentioned that this is intended as an overview of what has occurred since the last meeting for those issues that are otherwise not specifically on the agenda.

The 324 Building, in the 300 Area, has a highly concentrated amount of radioactivity beneath the building. It is primarily from cesium that leaked from a hot cell during operations. Ken took a tour of this facility in October – staying on the “clean” side of building – so he could get an idea of how much work will need to be done to remediate the site. The contamination is so far staying beneath the building, though there have been some water line breakages in the area in the past. Such an event could mobilize the contaminants.

Ken indicated that they have built a full-scale mock-up of the 324 Building at another location so they can practice how to work safely before they actually start anything onsite. The mockup has all the same dimensions and openings as the real facility. Ken indicated that there has been success at other cleanup sites by building these full-scale models to practice and prepare the workers that will complete the job.

Ken said that there is some good news to report about the groundwater treatment operations on the site. Hanford set a record by treating 2.1 billion gallons of groundwater during the past fiscal year and removed 75 tons of contaminants. Also, the 200 West Pump and Treat Facility has added a treatment train to capture uranium.

DOE completed a land transfer of 1,641 acres of Hanford land to the Tri-City Development Council – the local economic development authority in the Tri-Cities. The transfer was required in Congressional language in a funding bill passed last year that was inserted by Washington Congressman Doc Hastings before he retired. Ken said the land is not the exact parcel that had been requested. DOE had to exclude certain sections, including lands still under or near active cleanup, an old municipal landfill, and an early homestead site that may have historic or cultural significance.

A question about the land transfer was posed by Paige Knight, a member of the audience. Ken responded to her question by stating that the Native American tribes have expressed strong interest in being consulted before any land transfers take place.

Stacy Charboneau, U.S. Department of Energy-Richland Office (DOE-RL) Manager, then addressed the question further by adding that even though DOE had congressional authorization to convey this land by September 30, DOE did consult with the tribes during this process. Stacy said the tribes would be consulted in mitigation activities like selecting native plant species that should be planted on this site as part of re-vegetation work.

Mecal asked if this area is accessible by the public and Ken responded that this is near the 300 Area near Horn Rapids Road and is publicly accessible.

The Tri-Party agencies have extended the comment deadline to February 12 on an expansive proposed change package for cleanup work to be done on Hanford's Central Plateau. Ken mentioned that the Board had discussed this issue at their previous meeting. ODOE did provide written comments. A lot of people have been upset by these proposed changes, because it generally results in delays of a decade or more in most cleanup work on the Central Plateau. Ken said the Board now has some time to comment if they choose.

After 24 years of litigation, the final plaintiffs in the Hanford downwinder litigation have reached settlement or dropped their claims. At its peak, there were between 3,500 and 5,000 claims against the government, claiming they were harmed by releases of radioactive materials from Hanford during the early days of operation. In 1986, DOE released 19,000 pages of documents that revealed that during its operations, Hanford had released extensive amounts of radioactive materials to the air and to the Columbia River. That prompted a dose reconstruction project and an epidemiological study, and led to the litigation as well. Ken said the burden of proof was pretty much on people to demonstrate that they would not have incurred cancers or other diseases if not for their exposure to Hanford releases.

Mecal asked Ken about the settlements and Ken replied that the settlement information is confidential.

Hanford Challenge, a Seattle-based watchdog group, in November called for a stop to all work on Hanford's Waste Treatment Plant (WTP) and the appointment of an independent organization to design a new path forward for treating Hanford's tank waste and to determine if the vitrification plant can be salvaged. They also called for the immediate construction of 12 new double-shell tanks. DOE's response at the time was that it is committed to the successful completion and operation of the WTP, and is working towards a sequenced approach to completion, with some low-activity waste vitrified beginning in 2022.

At the Waste Isolation Pilot Plant (WIPP), a geologic disposal site in New Mexico for transuranic waste, preparations continue towards resuming disposal operations at the facility sometime later this year.

WIPP has been shut down since February 2014 after a chemical reaction in a waste barrel caused it to breach, and it spread radioactive material throughout the underground.

One of the priorities is to increase air flow in WIPP. DOE is installing a new interim ventilation system, which will work with existing underground ventilation (both in filtration mode) to provide additional airflow to the underground. As part of that, DOE has installed a large fan in front of the air intake shaft to draw additional air into the mine.

Investigators who reviewed the incident and a separate vehicle fire came up with 144 corrective actions before operations at WIPP could restart. WIPP has completed 121 of the corrective actions and expects to finish the rest in the next 90 days.

Dan Solitz, Board, asked about the backlog of transuranic waste at Hanford, and what is ready to ship to WIPP from various other sites. Ken said once the ventilation has been improved and workers can again emplace waste into the repository, the focus will first be on waste that is already on site. There are also several sites with waste ready to go, such as Idaho National Laboratory, Los Alamos National Laboratory, the Savannah River Site and the Oak Ridge Site. Based on changes in the M-91 milestones during the middle of 2015, Hanford is not expected to resume shipments until about 2024. From that point forward, Hanford would be the primary DOE shipping site. The plan is for six years of concentrated shipping activity before WIPP's scheduled closure in 2030. Oregon did comment on this milestone and suggested shipments starting prior to 2020. Ken said ODOE staff did not think six years was realistic. Ken added that although WIPP is currently scheduled to close in 2030, it does not preclude an extension of WIPP's life if there is such a need.

Dan asked about potential weapons grade plutonium shipments to WIPP. Ken said there is a proposal to take this type of waste from the Savannah River Site and dispose of it at WIPP. The Carlsbad community is supportive of this plan and others for expanded use of the site.

Moving on to cleanup progress around the site, Ken said one of the last things that needs to be done prior to beginning demolition of the Plutonium Finishing Plant (PFP) is decontaminating the Plutonium Reclamation Facility canyon. Ken showed a picture from 2013 that showed "pencil tanks" hanging in the canyon as well as debris on the canyon floor. In 2015, workers removed the last of the 52 pencil tanks and have since been working on cleaning up the canyon floor.

To help map the location of the contaminants, workers have been using a gamma radiation mapping device called the Gray Cube (GrayQb), which provides a visual depiction of where contamination remains. Ken showed an image from the device, which clearly showed a concentration of radioactive materials on a structure used for hanging pencil tanks.

During previous Cleanup Board meetings, Ken had shown the Board members that workers in some very contaminated areas of PFP were wearing a pressurized protective suit. Small amounts of contamination

had been getting into the suit's cooling system, called a Vortex Cooler. Before this problem was discovered, some of these contaminated units were taken off site.

Stacy said there shouldn't have been any contamination within the suits and the cause is still being investigated. DOE and its contractors are also reviewing their procedures to ensure this doesn't happen in the future. She mentioned that a Hanford Fire employee did receive a very small amount of internal contamination while he was handling the coolers.

At the 618-10 burial ground, workers have begun to auger the waste in the vertical pipe units (VPUs). There were 94 VPUs, which were mostly five 55 gallon drums without tops or bottoms, welded together, to form a vertical disposal pipe into the soil. Laboratory waste from the 300 Area, some of its fairly hot, was dumped into the VPUs.

More than a year ago, workers installed steel over-casings around 80 of the 94 VPUs. Then they use a giant auger to grind up and mix the barrels and the waste and surrounding soil.

Crews from Washington Closure Hanford have so far augered 18 of the 28 VPUs they are contracted to do. Since their contract ends this year, the rest of the work will likely transition to another contractor. They are currently ahead of schedule. They plan to use a clamshell type device to retrieve the waste beginning probably in April.

Work also continues to retrieve drums from burial trenches. They're up to about 1,400 so far and hope to be complete by summer. Crews are processing concrete-lined drums. They submerge the barrels in hoppers which are filled with grout, and then crush and mix up the waste. Doing this with the drum submerged in grout prevents a release from the drum when it's opened.

There have been some recurring contamination problems from the burial ground itself – the latest was during high winds in November, when some particles of radioactivity were spread outside of the controlled area.

Mecal asked for more details about the contamination spread from the 618-10 burial ground. She understood some contamination had spread to a nearby highway.

Ken said there have been multiple occasions where contamination has spread from the burial ground. It is a large open area which is subject to, at times, very high winds. Workers have had limited success using various materials to control the contamination.

Stacy also responded to this question. She said DOE and its contractor have examined several methods to prevent this from happening in the future. She said this incident has given them more opportunity to also look at 'legacy waste incidents' where contamination is spread over the site by animals and plants.

Just across the road from the 300 Area, near a borrow area, is another burial ground that they discovered. Workers have been taking about 100 truckloads of waste per-day from this site to the

Environmental Restoration Disposal Facility (ERDF). Ken said that they expect to finish that work sometime this coming summer.

Hanford workers have made substantial progress in backfilling and re-contouring cleanup sites in the reactor areas. Ken showed a photo from the D Area. Crews are planting native vegetation in the area. They expect to complete about 280 acres this winter.

Ken reviewed the numerous comment letters that ODOE staff have written on various topics since the last Board meeting. He mentioned both a letter from the agency and a follow up letter from the Cleanup Board to Energy Assistant Secretary Monica Regalbuto, asking that a Hanford-specific risk study not receive any additional funding.

ODOE staff also provided comment letters on a proposed amendment to the ERDF Record of Decision and on significant proposed changes to Tri-Party Agreement milestones related to Central Plateau cleanup. Ken pointed out that this letter identifies Oregon's cleanup priorities for the next 10-12 years. ODOE also provided a letter to DOE expressing some concerns about DOE's plans to move forward with a test drilling of a deep borehole, as an eventual potential option for disposing of Hanford's cesium and strontium capsules.

DOE-ORP Update

J.D. Dowell, Deputy Manager for DOE's Office of River Protection (DOE—ORP), provided the Board with an update on a number of issues related to Hanford's tank waste storage and treatment program.

J.D. reported on some senior staff changes: Mark Edgren is the new Chief of Staff, Elaine Diaz the Chief Engineer and Technical Advisor, and Carrie Meyer is the Director of Communication and Information Management. Mark Lindholm is the new President and Project Manager for Washington River Protection Solutions.

J.D. said the President's proposed budget for the current fiscal year has an increase of about \$200 million for the tank waste program, for a total of \$1.414 billion. Much of that increase comes in the tank farm budget and to support the design and construction of the low-activity waste (LAW) pre-treatment system.

Tank waste retrievals in the C Tank Farm are continuing. Two tanks remain - C-105 and C-111. C-102 was the most recent to be completed, although workers were unable to retrieve about 15,000 gallons of a hard heel in that tank. About 300,000 gallons of waste was retrieved from that tank.

About 67,000 gallons of waste remain in C-105. There were about 132,000 gallons of waste when retrieval began. Work has been halted to repair the Mobile Arm Retrieval System (MARS) after a high pressure nozzle was damaged.

About 23,000 gallons of waste remains in C-111. The workforce from C-105 was moved to this tank while the MARS unit is being repaired. J.D. said the sluicing system being used in C-111 has a hydraulic leak. Work will have to stop soon to fix this problem.

DOE has been using an exhauster in tank T-111, which is known to be actively leaking, in an effort to dry up as much of the waste as possible and lessen or stop the leak. That campaign has been suspended for now to determine whether it needs to continue. About 3,300 gallons of waste was evaporated.

DOE is scheduled to begin pumping liquids by March 4 from double-shell tank AY-102, which has been actively leaking from its inner shell into the annulus (the space between the two tank shells). The March 4 start would meet an agreement they have with the State of Washington. J.D. said a lot of work has been done in the past six months to prepare for the start of waste retrieval.

J.D. provided a brief update of work on the WTP complex. Limited construction work is continuing on the high-level waste facility. No construction work is occurring on the pre-treatment facility, as testing continues to resolve several design issues.

DOE is proceeding with plans for direct feed LAW using the low-activity vitrification facility.

John Howieson, Board, asked J.D. to explain the difference between emptying a tank and closing a tank. J.D. replied that closure involves a Performance Assessment that looks at the long-term impact of the residual waste remaining in the tank to the environment and human health. DOE is required to retrieve 99 percent of the waste from each farm – not each individual tank. The one percent of material that remains must meet the performance assessment requirements. J.D. said final closure will likely involve filling the tanks with grout.

Steve Pfaff, DOE-ORP Federal Project Director, explained the direct-feed LAW program. Waste would be pumped from the AP tank farm – the closest to the WTP complex – to a simplified pre-treatment facility. That facility would remove cesium and solids – which would be returned to the tanks. The remaining waste stream would be sent by underground piping to the LAW vitrification facility. The intent is to operate the LAW facility at its regular capacity – around 30 metric tons of glass per day.

To initially treat some of the effluent, Steve said they are also designing an Effluent Management Facility. Groundbreaking for that facility has already begun. Steve said the goal is to begin vitrification by the end of 2022.

Dan asked why the cesium would be removed from the waste stream, only to be returned to the tanks. Steve explained that it was a tough decision for DOE, but that they did not want to create a new waste form that might have no easy disposition. For now, returning the cesium to the tanks seems like the best solution.

DOE-RL Cleanup Priorities through the Next Decade

Stacy provided the Board with an update on the Richland Operations Office activities. She commented that of the estimated \$110 billion to \$120 billion dollars' worth of work remaining at Hanford, more than \$50 billion falls within the responsibility of the Richland Office.

Dan asked Stacy how much of that figure is fixed costs and how much goes towards remediation. Stacy indicated that with a roughly \$1 billion budget each year, about half goes towards fixed costs. That includes supporting a lot of the infrastructure needs for DOE-ORP as well. Stacy said that because the infrastructure at Hanford is aging, those costs for maintenance and repair/replacement will be going up just to support work at the site for many years.

This year, the Richland Office is very much focused on completing work at PFP. Workers just finished grouting the floor of the Plutonium Reclamation Facility building last week. Stacy said that open air demolition of the Plutonium Reclamation Facility will hopefully begin this spring, followed by the americium facility and finally the main PFP building. All of this is very hazardous work, but they hope to get a lot done before the end of the year.

Stacy gave the Board an overview of the "Vision" of her office for the next 12 years. It is centered on four key elements: continued cleanup of the nuclear facilities and waste sites; continue to protect the groundwater; provide infrastructure for continued safe operations; and restore lands for access and use. Stacy then went into some specifics on much of the planned work for the next 12 years.

- **K Basin Sludge Transfer** – Move the remaining sludge now stored in the K East Basin to T Plant. DOE has a Tri-Party Agreement milestone to begin sludge transfer by September 30, 2018, and to complete that work by December 31, 2019.
- **Complete Remaining River Corridor Cleanup** – This includes several large and expensive projects, including completion of both the 618-10 and 618-11 burial grounds; remediating the concentrated radioactive soil beneath the 324 Building as well as demolishing the building; interim safe storage of the K-East and K-West reactors; and any remaining soil cleanup. The 618-11 burial ground has the added complication of being located next to the Columbia Generating Station nuclear plant, and cleanup of the burial ground cannot interfere with the plant's operations. Stacy said there is some discussion about possibly moving the milestone for this burial ground back at least four years.

John asked Stacy about the extent of the soil contamination beneath the 324 Building. Stacy said they have been able to map the entire plume. The highest readings (12,000 Rad per hour) are at the construction joint of the B cell. Stacy said that they will continue to monitor this area as they prepare for cleanup work. Stacy said that the plume so far is staying put.

Dennis Faulk, U.S. Environmental Protection Agency (EPA), indicated that the 324 Building work will be a priority and everything else will have to follow depending on funding. He agreed that 618-11 will require a great deal of planning.

- **Complete Capsule Transfer from the Waste Encapsulation Storage Facility to Dry Storage** – Workers recently completed an upgrade of the facility’s ventilation system. The goal continues to be to move the cesium and strontium capsules into shielded casks and get them out of the water-filled storage basin.
- **Complete Infrastructure Upgrades to Accomplish the Site Mission** -- Stacy said that DOE had gone through a period of “run to closure” and “run to failure,” but that doesn’t work so well for the infrastructure that will be needed to continue to support cleanup activities for the next several decades. One need is to sustain and upgrade power lines and poles. There are 6,000 power poles across the site and 246 miles of power lines. The water systems are also badly in need of upgrading. The site uses 800 million gallons of water annually. There are 95 miles of buried pipe. Water leaks are occurring and originating from 1940s vintage water lines across the site. This also creates potential sources of transient water near waste sites that could move contaminants. Stacy said that all of these infrastructure issues are being addressed in the plans and operating budgets. Roads also need to be maintained or replaced. Stacy said that over 5,700 passenger vehicles travel on Hanford roads. The roads need continual upgrading and maintenance.
- **Expand Groundwater Cleanup** – Stacy said that they want to expand the groundwater cleanup work, as it is the most likely pathway for contaminants to reach the Columbia River. A uranium treatment train was just added to the 200 West Pump and Treat System and Stacy said this is working very well.
- **Retrieve, Treat, and Enable Shipping of Transuranic Waste to WIPP** – Stacy said the goal is to retrieve and treat contact and remote handled transuranic waste and prepare for shipments to WIPP. There are many drums and containers in the Central Waste Complex waiting to be re-packaged for shipment to WIPP. When WIPP re-opens, there are other DOE sites that will be ahead of Hanford in the shipping schedule. Stacy said that if Richland got the approval to start shipping, it would take \$100 million extra to do that.

Ken asked about possibly shipping some waste to Idaho for treatment, prior to shipping directly to WIPP. Stacy said DOE is interested in possibly doing that at some point.

- **Continue Cleanup of the Central Plateau** – Stacy said there is a lot of work to complete at the Central Plateau. The near-term focus will be on completing waste site characterization and treatability tests, obtaining Records of Decision, and remediating waste sites.
- **Initiate Canyon Disposition** – Stacy said that they are continuing to conduct demolition preparation and hazard reduction. They still need to complete canyon characterization for B Plant, PUREX and REDOX. Eventually, workers will complete the above grade demolition of the U Plant canyon and remediate adjacent waste sites and install a protective barrier.
- **Restore Hanford Land for Access and Use** – Stacy concluded by talking about the long-term goal to restore the land for public and tribal access and use. DOE will work closely with all of its partners to enable reuse of Hanford land consistent with the Comprehensive Land-Use Plan.

Stacy said they aren't spending \$2 billion a year to just place a fence around the site – they want to return use to the communities and stakeholders.

Ken said ODOE staff had spent considerable time in recent months in developing its own priorities. He said there isn't much disagreement with DOE, it's more about sequencing the work. Stacy responded that it is good that Oregon is closely aligned with DOE about cleanup priorities.

Jane Hedges, Washington Ecology, said she is confident in the path that DOE-RL has laid out for priorities. Ecology was involved and consulted in many of the cleanup priority discussions. Jane added that so much of the work depends on funding, and Washington and Oregon congressional delegations have been stellar in their support of the work that needs to be done at Hanford by advocating for funding.

John asked about Min-Safe costs and whether they were growing or contracting. Stacy said that the cost is escalating at about 2.3 percent per year, based on inflation. She said that it does help to demolish some of the facilities that cost a lot of money to maintain. However, sometimes costs are somewhat out of their control. She mentioned that security requirements following the terrorist attacks in 2001 drove up spending across the site. The added requirements for safeguarding spent nuclear fuel eroded any savings that might have otherwise been realized. Security costs at the site are still about \$70 million a year.

Perspectives of a Long-Time Hanford Regulator

Jane is about to retire after 11 years in her current position as the Hanford program manager at the Washington Department of Ecology and was asked by ODOE staff to provide her perspectives on the Hanford cleanup.

Jane said she was born and raised in the Tri-Cities. After being involved in other environmental work during her professional career, she and her husband returned to the Tri-Cities so he could take over operations at his family winery. She then went to work at Ecology and eventually was promoted to her current position overseeing Hanford cleanup. Jane said there are about 75 staff in her office that work on Hanford. Ecology is a party to the Tri-Party Agreement.

Jane said that while there is a lot of important and difficult work that remains, we shouldn't lose sight of the cleanup accomplishments that have occurred. She highlighted the efforts to treat the groundwater and shrink the size of the plumes and noted the construction and operation of the 200 West Pump-and-Treat system and efforts to keep chromium from entering the river. She also noted the removal of plutonium from the Hanford Site and the progress in emptying some of Hanford's single-shell tanks.

Jane said it was fulfilling as a regulator to be able to work alongside EPA.

She hopes that the work along the river will allow both tribal and local access again in the near future.

Jane praised the work of the ODOE staff and of the Cleanup Board.

Public Comment/Adjourn

There was no public comment offered.

Mecal adjourned the meeting at 4:55 p.m.

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Ivan Gall (Oregon Water Resources Dept.)
Ken Niles (Oregon Department of Energy)
Rep. Greg Barreto
David Close, CTUIR

Dale Engstrom
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- Colleen French
Washington Department of Ecology
- John Price
- Dieter Bohrman
U.S. Environmental Protection Agency
- Dennis Faulk

Public:

Paige Knight
Sharon Monteiro

ODOE Staff:

Mark Reese
Dirk Dunning

Delores Valarie Close
Kamisha Langsdale

Mecal called the meeting to order at 8:35 a.m.

Administrative

David Close, Confederated Tribes of the Umatilla Indian Reservation (CTUIR), introduced himself. He was recently appointed to replace Armand Minthorn as the tribal representative to the Cleanup Board. David sits on the CTUIR Board of Trustees as the Secretary. He recently moved back to Oregon from British Columbia where he was a professor at the University of British Columbia for the past seven years.

Deep Borehole Disposal

Dirk Dunning, ODOE, provided the Board with information about DOE's plans to conduct a deep borehole test program, and shared information from a two day international workshop sponsored by the U.S. Nuclear Waste Technical Review Board (NWTRB). Dirk observed the workshop by teleconference. The Board heard from international experts about experiences with deep borehole drilling.

Dirk told the Board that DOE has been considering the idea for about 50 years to dispose of nuclear waste into deep boreholes. The basic concept is to drill about 5,000 meters (about three miles) into crystalline rock. The waste would be placed in the bottom two kilometers of each borehole. The upper part would be sealed with compacted clay and cement plugs.

DOE is considering certain waste streams as potential candidates for deep borehole disposal, including Hanford's 1,936 cesium and strontium capsules; some small-dimension DOE spent fuel; and possibly the calcined high-level waste at the Idaho National Laboratory.

The advantages are that there are many possible sites available; DOE could use existing drilling technology; and it could possibly occur sooner and be cheaper than waiting for a deep geologic disposal facility. The presumption is that at a depth of three miles, the waste would be completely isolated and would not pose a threat to groundwater.

Dirk then discussed the desirable attributes for a site as identified by DOE: crystalline rock within 2,000 meters of the surface; an absence of commercial mineral resources, such as oil and natural gas; absence of volcanoes or recent faults; low seismic risk potential; and low heat flow and moderate temperatures. Dirk found that only a few areas in the United States met all of these criteria. These areas were principally in the Midwest and along the southeast Atlantic states.

Dirk said DOE has two different means of putting waste into the borehole

- A drill string emplacement, where all the waste packages are connected together and lowered as a single package. A drawback is this package could weigh as much as 600,000 pounds.
- Wireline emplacement, where each waste container is lowered one at a time.

DOE issued a Request for Proposal for a field test borehole last April. DOE hopes to drill one characterization well and one test borehole. They will also develop surrogates for actual waste test packages. DOE has indicated it does not intend to dispose of waste in these test boreholes.

On January 5, DOE selected a Battelle Memorial Institute-led team to drill a test borehole near Rugby, North Dakota. The site is on 20 acres of state-owned land. DOE plans about a four year, \$35 million test program, with the borehole drilled by early 2018 and the surrogate waste emplaced during the following year. Initial reaction from area residents since the announcement has been mostly negative.

The NWTRB workshop included two days of presentations and discussions with the NWTRB members. The participants identified a wide array of issues and challenges with DOE's concept. The workshop included panels on drilling; waste emplacement; sealing the boreholes; hydrogeology; geochemistry; barriers; and efficacy.

The participants said that while there have been a number of deep boreholes drilled around the world – including one borehole in Russia to 12.2 kilometers – it is still a very difficult thing to do and DOE’s plans test the limits of existing technology.

Many of the panelists suggested that unless waste disposal actually occurs very near to the test borehole, that the information obtained from the test would not be very useful.

Dale Engstrom, ODOE staff, mentioned that deep wells by their nature are expensive to construct. And they get more expensive the deeper that you go.

Greg asked how many holes are necessary to accommodate the current inventory of waste. Dirk said that even with a small diameter borehole, having more than a kilometers worth of space would allow for a lot of waste. Only one hole would be needed for Hanford’s cesium and strontium capsules.

Lori Brogoitti, Board, asked about the impacts from fracking and the increased seismic activity in this area of the country. Dirk said that the fracking activity is going on further west in the region and not where they are proposing to drill the test holes.

Dale told the Board that the deeper you go, the greater the potential there is for problems because things move and shift. Trying to drill a hole through thousands of feet of rock and other material is incredibly difficult. Dale added that the Norwegians found out that you can’t drill a precisely straight hole at this depth. They had their equipment start moving at angles when they attempted it.

Ted asked what has happened to the original idea for a deep geologic repository. Ken responded that DOE is still pursuing that. They believe that deep boreholes would give them additional disposal options for certain waste streams. DOE has embarked on a nearly year-long process to develop a “Consent-Based Siting” process, to hopefully find a willing host for a spent nuclear fuel consolidated storage facility and a repository. He said there are commercial efforts underway in West Texas and in Eastern New Mexico – supported by the local communities – to develop consolidated storage facilities for commercial spent nuclear fuel. Congress would have to amend the Nuclear Waste Policy Act to allow DOE to pay these companies to store the fuel.

Ecology Update

John Price, Washington Department of Ecology, provided the Board with a brief update. He mentioned Ecology had hired several new staff. He provided an update on Ecology’s efforts to reissue their 15,000 page Hanford Site Permit (next public review expected in 2017/2018). He also outlined several outreach activities that Ecology has conducted in Oregon.

Lori asked John why Ecology only went to Northeast Oregon a single time in 2015 (to Hermiston). She thought rather than focusing on the Portland/Vancouver area that there would be greater benefit to spending more time in Northeast Oregon where there is a greater concern about Hanford issues. Dieter

Bohrman, Ecology, acknowledged that they have spent more time in the Portland and Vancouver area in the past, but he agreed they should probably do more presentations closer to home this year. Lori said that she would help with garnering support for some presentations near Pendleton.

John said Ecology would like to do more outreach with the Tribes. David thought there would be interest in some presentations for the CTUIR.

Manhattan Project National Park

Colleen French, the Manhattan Project National Park Program Manager for DOE-RL, provided the Board with an update on efforts to develop the park.

In 2004, Washington Senator Maria Cantwell commissioned the Manhattan Project National Historic Park Study Act. The goal was to look at whether it was appropriate and feasible to have such a park. This would also create a new unit within the National Park Service (NPS) to focus on the Manhattan Project. In 2006, funding became available and the NPS began the study with assistance from DOE. This included public meetings at Oak Ridge, Tennessee; Los Alamos, New Mexico; and Hanford.

In 2009, the NPS concluded that it would be appropriate to only create a park at Los Alamos. DOE countered that all three sites were equally important to tell the story of the Manhattan Project. In 2010, DOE wrote to the Director of the NPS, asking that Oak Ridge and Hanford be included in the Park option.

In 2011, the Department of Interior, with DOE concurrence, transmitted a recommendation to Congress for a new unit within the NPS system to interpret the Manhattan Project. Legislation was eventually passed by Congress in late 2014 as part of the 2015 National Defense Authorization Act.

Colleen said that the purpose of the legislation is to preserve and protect nationally significant resources associated with the Manhattan Project; improve public understanding of the Manhattan Project and its legacy; enhance public access and assist DOE, historic park communities and interested parties that are committed to protecting the historical significance of the Manhattan Project.

Colleen then gave the Board an overview of all of the sites at Hanford that are included in the Park. They include the B Reactor and T Plant, and several facilities that pre-date Hanford – the Bruggeman warehouse, the Hanford Irrigation District Pump house, the White Bluffs Bank and Hanford High School.

Colleen said that some details are still being worked out to define roles and responsibilities of the two involved agencies. A Memorandum of Agreement was signed by both the Secretary of the Interior and Secretary of Energy in 2015. This also established Park boundaries and maps that will be published in the Federal Register.

The NPS and DOE will jointly manage the new Park. The DOE is responsible for preservation and maintenance of the Park facilities and associated historic elements as well as increasing public access to

the Park areas. The NPS is responsible for interpreting the story of the Manhattan Project and providing visitor services.

The site tours and B Reactor tours will continue. The age requirement for B Reactor has changed and younger visitors can now tour. Families will be able to tour together and schools will be able to visit more often. Colleen said that a large group of fourth grade students helped raise the NPS flag at B Reactor this past November.

Colleen said a public meeting is scheduled in February in Richland. The goal is to help gather more information from the folks that lived the Hanford experience, or had family directly involved during the Manhattan Project years to get the story information so that it can be included in the NPS narratives.

Ted asked about the boundaries at Hanford for the park and he also asked about a visitor's center. Colleen said that the boundaries tend to be right around the historic site itself and there are no plans right now for a visitor's center.

Ken asked about access issues. Ken indicated that with B Reactor, it is pretty straightforward to provide public access to that facility. With Oak Ridge and especially at Los Alamos, some of the historic areas are deep within the security area. He asked how that would be resolved.

Colleen said the other sites are struggling with that issue. She said options such as virtual tours and other uses of technology are being considered. All of this is being discussed in the planning process.

David asked about tribal involvement in the planning process. He hopes that Native Americans' involvement at Hanford is part of the story that will be shared. Colleen said the tribes have been very much included in the planning meetings. Colleen said Tribal involvement is part of the history and it is important. David said that area tribes have some negative history with NPS and the story that was told for many years about the Whitman Mission. He said that it took quite a long time to get gaps in that history accurately reflected.

Ted asked how they plan to effectively tell the story about what happened on the site between 1943 and 1946 when much of it no longer exists. Colleen responded that they hope to tell the story with what does still exist, like B Reactor and T Plant. She acknowledged that the fuel fabrication facilities in the 300 Area are all now gone, but also said the NPS has told important stories elsewhere in the nation without having some of the original facilities available. Ted reiterated that he hopes that they give thought to what an interpretive center would add to the experience of touring Hanford.

Ken asked whether the Columbia Reach Interpretive Center might be a partner in helping to tell the story. Colleen said a variety of possible partnerships are being looked at, but logistically the Interpretive Center would add some additional complications as it is a few miles from the Hanford Site and a long way from B Reactor.

Paige offered public comment and she thanked Colleen. She also advocated for the development of an educational piece to include school-aged kids.

Colleen concluded by reminding the Board that there is a period for public comment as it relates to the Foundation Document for the park. She encouraged the Board to give input in that process. That process will conclude by the end of this fiscal year in September.

Issue Updates

Ken provided the Board with an update on litigation related to tank waste retrievals and treatment.

The litigation was initiated in 2008 when it was clear to Washington that DOE would not meet deadlines to have the tank waste treatment facilities operational by 2011. Oregon joined the litigation as it related to reporting requirement.

A settlement was reached in 2010 and new schedules were agreed to for the start of the Waste Treatment Plant and the retrieval of 19 single-shell tanks. The agreement was filed in a Consent Decree.

The litigation was revived in 2014 after DOE indicated it would not be able to meet many of the new milestones.

Since that time, there have been numerous filings and two oral arguments. Both DOE and the State of Washington submitted proposed Consent Decree modifications to the Court.

Ken said the position of the two parties – at least on paper – has been somewhat contentious. In their most recent filings in December, the two sides remain far apart on some issues – primarily on deadlines and whether new double-shell tanks are necessary.

Washington proposed 35 milestones to track progress towards initial full plant operations by September 30, 2034 with the first milestone being due in 2016. DOE proposed 16 new milestones to get to initial full plant operations by December 31, 2039 with their first milestone due by 2030.

Washington proposed specific milestones for resolution of technical issues. DOE does not propose specific milestone dates, but indicated that if technical issue resolution is not complete by June 30, 2019, most milestones, including the 2039 start-up date, would be pushed back.

Washington proposed commissioning the low-activity vitrification facility by December 31, 2022 to support a 2022 start-up of Direct Feed LAW. DOE proposed commissioning the low-activity vitrification facility by December 31, 2036, saying the Court ruled it would not amend the Consent Decree to include Direct-Feed LAW. DOE did say it intended to have the facilities operational in 2022.

Washington proposed completion of the remaining Consent Decree waste retrievals by September, 30 2022, with interim milestones in 2017 and 2019 for completion of four specific AX farm tanks. DOE

proposed completion of the remaining Consent Decree waste retrievals by March, 31st 2024, with interim milestones in 2018, 2020 and 2023 for startup of a certain number of waste retrievals.

Washington proposed milestones to require evaporator use to create 8.77 million gallons of tank space by September 30, 2022, with 1.4 to 1.6 million gallons evaporated each year. DOE proposed milestones to require evaporator use to create 5.9 million gallons of tank space by March 31st, 2023, with .6 to 1.6 million gallons evaporated each year.

Washington proposed “triggers” to require constructing two million gallons of new storage space contingent upon DOE’s failure to meet retrieval or evaporator milestones. Washington also proposed milestones for submittal of a detailed project plan for new tanks in 2016, a RCRA/Dangerous Waste permit modification in 2018, and design completion in 2019.

Ken said that DOE did not propose specific triggers related to double-shell tank (DST) construction, but instead proposed a series of conditions by which their obligations to build new DSTs would be suspended. DOE proposed that if they become conditionally obligated to construct new DSTs, they would only build the necessary capacity to offset volume not removed by the evaporator.

Washington contended that “Energy proposes conditions on contingent construction that virtually guarantee no new DSTs will ever be built. Energy’s convoluted Evaporator targets include caveats allowing Energy to readjust the targets, and avoid triggering new DSTs, by determining that it can still meet its overall goals through schedule adjustments and other mitigation measures.”

Ken said DOE objected to requirements to permit and design tanks before any obligation to build new tanks is triggered. “DOE estimates that the up-front work proposed by the State would cost approximately \$75-105 million for two tanks. This expenditure would not only be an extraordinary waste of taxpayers’ funds, but could divert resources from other tank retrieval and WTP-related activities mandated under the Consent Decree.”

Ivan Gall, Oregon Water Resources, asked about the discrepancy in how much the evaporator will be needed. John Price said Ecology and DOE disagree often when it comes to evaporator use and space that is made available after campaigns. It’s always a back and forth discussion.

Board Business

The Board set the next meeting date for May 9 and 10 at the Tamastlikt Cultural Center on the CTUIR Reservation in Mission.

Board members agreed to have staff draft a letter to the NPA on behalf of the Board encouraging the NPS to engage multiple publics throughout the Pacific Northwest in developing the story of Hanford.

Mecal’s first term as Chair of the Board has expired. She indicated a desire to run for re-election. Kristen McNall also indicated her interest in the Chair position. The Board voted 6-6. As the Board bylaws do not

account for how to resolve a tie, Mecal said she would talk with Kristen when Kristen returns from vacation and Mecal will likely concede the election to Kristen.

Ted Taylor was voted in as Vice Chair.

Mecal had previously indicated that she no longer has sufficient time available to commit to the HAB, and wanted to step down as the Board's primary representative. Kristen, who had been serving as the Alternate, is willing to assume the Primary seat. The Alternate position will remain open until a Board member indicates interest in serving.

Ken mentioned that ODOE will sponsor a Hanford Site tour likely in June. He hoped that new members – Glen, David and Greg – would be able to attend. He also indicated that Board members who had not been on a tour for a few years would be welcome to participate.

Public Comment/Adjourn

Sharon Monteiro thanked the Board for their work.

Mecal adjourned the meeting at 1:23 p.m.