

Oregon Hanford Cleanup Board

The Discovery Center, The Dalles, Oregon

Monday, September 26, 2016

Members In Attendance:

Kristen McNall, Chair
Ted Taylor, Vice-Chair
Lori Brogoitti
Steve March
John Howieson
Glen Phillips
Dave Ripma
Dan Solitz
Bryan Wolfe
Mecal Seppalainen
David Close, CTUIR
Justin Iverson (Oregon Water Resources Dept.)
Michael Kaplan (Director, Oregon Department of Energy)
Rep. Jeff Reardon
Sen. Richard Devlin

ODOE Staff:

Ken Niles
Mark Reese
Dirk Dunning
Dale Engstrom
Sara Lovtang

Administrative

Chair Kristen McNall opened the meeting at 1:01 p.m. and welcomed Board members and guests.

The May Board meeting minutes were approved with no changes suggested.

New Staff:

Sara Lovtang, Oregon Department of Energy's (ODOE) new Hanford Ecologist, introduced herself to the Board. Sara was hired in June to replace Paul Shaffer, who retired. Sara came from the United States Forest Service where she was an ecologist for several years. Her main focus will be in representing Oregon in the Hanford Natural Resource Damage Assessment and Restoration process.

Tri-Party Agencies:

Steve Pfaff, U.S. DOE-ORP
Jeremy Johnson U.S. DOE-ORP
Wendell Wrzesnski, U.S. DOE-ORP
Sahid Smith, U.S. DOE-ORP
Dieter Bohrmann, North Winds (DOE-ORP)
John Price, Washington Department of Ecology
Randy Bradbury, Washington Department of Ecology

Public

Eileen Laramore
Sharon Monteiro
Morgan Gratz-Wesier (staff to Sen. Devlin.)

Reflections on June Hanford Tour:

In June, Board member Glen Phillips was able to take his first Hanford Site tour. Glen said the tour was interesting and informative. Glen found the historical information about the site fascinating.

Kristen also went on the tour – her first since 2010. Kristen said that there are a lot fewer buildings than there were on her previous tour. The Environmental Restoration Disposal Facility (ERDF) was amazing to see. “The last time I was here, it was a giant hole in the ground, and now it’s been filled up.” Kristen noted a lot of activity at the 618-10 Burial Ground.

It was also the first site tour for Sara. She enjoyed the tour. She wasn’t prepared for just how large the site is and its impact on the Tri-Cities economy.

Overall, Kristen, Sara and Glen said the tour was informative and worthwhile.

Review of Activities/Events Since May Meeting

Ken Niles, ODOE staff, provided a review of relevant Hanford activities since the Board’s last meeting in May, that would not otherwise be covered during the meeting.

U.S. Department of Energy-Richland (DOE-RL) Manager Stacy Charboneau has been promoted to a new position at DOE Headquarters. She is the new Associate Principal Deputy Assistant Secretary for Field Operations. All the DOE site managers will report directly to her. The new DOE-RL Manager is Doug Shoop, who has been Deputy Manager since 2008.

There was a large wildland fire on the site in late July and early August. Firefighters started a backfire on Rattlesnake Mountain to prevent the fast-moving fire from getting to contaminated Hanford facilities. It was a tough choice to burn the habitat and the mountain is once again all blackened.

Secretary of Energy Ernest Moniz and Assistant Secretary for Environmental Cleanup Monica Regalbuto visited Hanford in late August. They participated in meetings with site employees, labor leaders, tribal representatives and community members.

After the employee meeting, Moniz and Regalbuto visited the AP Tank Farm, where they received a briefing on new technologies that are aimed to provide additional data on tank vapors and increased protection for workers.

After their tour, both joined in an open-dialogue discussion with all four tribes with Hanford Site interests: the Wanapum, Nez Perce, Yakama Nation and Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The meeting focused on issues important to those tribes at the site.

Regalbuto also toured the 324 Building, which sits atop a highly contaminated waste site and remains one of the most important cleanup projects remaining on the Columbia River corridor.

A series of events are planned at Hanford's B Reactor both as part of the National Parks Service's 100 Year anniversary and to help launch the community partnership with this new National Park.

The Mid-Columbia Mastersingers will perform a choral concert inside the B Reactor on September 30 and October 2. The music will reflect themes of Hanford history, war and peace.

Washington State University Tri-Cities will hold an open house on September 28, where Hanford artifacts will be on public display for the first time.

A centennial celebration and fundraiser for the park service and Hanford History project will be conducted September 29 at the Washington State University Wine Science Center.

And, there will be a 15-mile bike ride sponsored by REI and Bike Tri-Cities on October 1 that will begin and end at B Reactor.

At the Waste Isolation Pilot Plant (WIPP) in New Mexico, efforts are still underway to recover from the accident that contaminated portions of the mine two and a half years ago. DOE has completed work on an interim supplemental ventilation system. The ability to move air through the mine is absolutely critical – right now they just don't have the capacity to move enough air to allow both waste emplacement and mining activities to be conducted at the same time.

Preparatory work is underway on a new expanded permanent ventilation system, which will include a new exhaust shaft and a 55,000 square foot ventilation building.

Pre-start activities are continuing at WIPP as workers verify and validate operating procedures in preparation for resuming transuranic waste emplacement operations – which are still tentatively planned for December of this year.

WIPP workers are conducting "Cold Operations," where simulated waste containers are placed underground. The new procedures are a lot different as there will now be a transfer of waste underground from the "clean" part of the facility to the "dirty" or contaminated part of the facility.

Ken said we are still not expecting shipments from Hanford for eight or so years.

Lori Brogoitti, Board, asked Ken whether WIPP tours will be resumed. Ken said DOE recognizes the value of being able to get people into WIPP to see what it is and how it operates. Ken wasn't sure when that might be, as the focus now is resuming operations. He did expect that Oregon would eventually receive a boost in its funding to send Board members and others on a tour.

About 300 Hanford workers have transitioned from Washington Closure Hanford (WCH) to CH2M-Hill Plateau Remediation Company. This is the result of WCH's contract ending after 11 years. The work at the 618-10 Burial Ground is part of this transition. Ken indicated the Board would hear much more about WCH's accomplishments during the Tuesday portion of the meeting.

ERDF reached its twenty-year operational milestone this past July. To date, 18 million tons of waste has been placed in ERDF. Additional expansions of the facility are expected in coming years.

Workers from CH2M HILL Plateau Remediation Company continue their preparations to eventually remove highly radioactive sludge from the 100-K West Basin. Workers have been practicing with their equipment for several months at a full-scale mock-up facility near the Fast Flux Test Facility. That equipment will now be moved to and installed in the K-West Basin. There is a milestone to install the equipment in the K-West Basin by September 2017. That work is currently on-schedule.

Ken said it has not been a great year as far as Tri-Party Agreement milestones standing firm. There have been a number of milestone changes during the past year, and when you look at them in totality, it is somewhat discouraging.

- In January, many milestones related to transuranic waste retrieval and packaging were pushed back a decade or more, and Hanford shipments to WIPP are not expected to resume until 2024.
- The settlement of the litigation regarding tank waste treatment and retrieval occurred in April. This pushed the date for full-operations of the Waste Treatment Plant (WTP) back 15 years.
- In May most Central Plateau cleanup work was pushed back by a decade or more.
- In July, the milestone to have the Plutonium Finishing Plant to slab-on-grade was delayed a year.
- In July, a draft cleanup plan for the 324 Building and the concentrated waste beneath it was proposed as a seven year project once it begins – which is in conflict with recently approved milestones for this project.

Ken said in the next few years, several projects have already been identified as “at risk” on “to be missed,” including efforts to keep strontium from the river in the N Area; the construction of a supplemental vitrification treatment facility; and the close of the C Tank Farm.

Ken mentioned agency comment letters that were in the Board packet, including ones related to Oregon’s perspective on radioactive material transport; the 324 Building Closure Plan; a Work Plan and Sampling Plan for plutonium contaminated sites in the Central Plateau; and the proposed plan for the D and H Reactor areas.

The Hanford Advisory Board (HAB) met twice since the last Cleanup Board meeting, once in June and earlier in September. Consensus advice was passed related to DOE’s selection of future Site contractors and the proposed plan for the 100 D and H Reactor areas.

Ken mentioned the agency is moving to a new building in December. It is the former Public Utility Commission Building, located on Capitol Street. The building has undergone major remodeling and will be a significant upgrade from the agency's home for the past 30 years, a converted grocery store.

Ken said that the building will have 14 conference rooms, and there was a competition to name them. One will be named the *2036 Room* to recognize the agency's Hanford work. That is the date of the new milestone to have the WTP fully operational. Ken extended an invitation to the Board to have one of its 2017 meetings in Salem at the new building.

John Howieson, Board, commented that he was shocked to see in Oregon's comment letter how little sampling DOE plans to use while retrieving some of the waste from the plutonium contaminated waste sites. John thanked Ken for Oregon's letters; said they were each well written; and reminded the Board that these are very serious problems that need to be addressed.

DOE-Office of River Protection (DOE-ORP) Update

Steve Pfaff, DOE-ORP, provided the Board an update on tank waste retrieval and treatment.

DOE has just about completed retrievals from the C Tank Farm. It is one of the original tanks farms, dating back to World War II. It includes twelve 530,000 gallons tanks and four 55,000 gallons tanks. The tanks contained primarily sludge. Only C-105 remains to be retrieved. It has been a challenge throughout. About 70,000 gallons of waste remains in the tank. They hope to have it completed by November 2017.

DOE has also retrieved waste from one tank in the S Tank Farm. That tank contained 612,000 gallons of mostly salt cake. That retrieval was primarily to develop technology for dealing with the salt cake.

Double-shell tank AY-102, which had leaked waste from its inner tank, is now about 95 percent retrieved. About 595,000 gallons of liquid waste and sludge has been retrieved. New extended reach sluicers were recently installed to retrieve the remaining waste. That is scheduled to begin in November. DOE is required to have the tank emptied by March 2017.

Steve said that DOE and its tank farm contractor are still trying to resolve tank vapor issues. Steve said this has been a recurring problem for decades. The Hanford Atomic Metals Trade Council, the union that represents the tank farm workers, has proposed a 200 foot boundary around the tanks in which any worker would be required to have supplied air. DOE has resisted that change.

Steve said a lot of different technologies are being tested to see if they can better improve vapor detection and monitoring.

Litigation is on-going related to the vapors – as both the union and the Washington Attorney General are seeking more worker protection.

Steve said that the tank farm contractor has a new website to provide updates about Hanford Tank Farm Vapors. That address is: www.hanfordvapors.com

At the WTP, work continues on the Low Activity Waste (LAW) vitrification facility. New equipment has recently been installed in support of operations by 2022.

One of the WTP support buildings recently received a permanent energy supply from a sub-station that was built specifically for this area. It is the first building in the WTP complex to be hooked up to permanent power.

Steve said there is a significant increase in the overall pace of construction, including startup and commissioning activities. This will continue for the next few years.

Dr. Sahid Smith, DOE-ORP, next spoke to the Board about the status of remaining technical issues at the WTP's Pretreatment Facility.

Sahid said there are eight outstanding technical issues. They are: hydrogen gas events in vessel headspace; criticality in pulse jet mixers; hydrogen in piping and ancillary vessels; Pulse Jet Mixer vessel mixing and control; erosion/corrosion in piping and vessels; design redundancy/in service inspection; Black cell vessel/equipment structural integrity; and off-gas treatment ventilation.

Sahid said the first three issues are expected to be resolved by the end of the calendar year.

Sahid said that a full-scale test vessel arrived in Richland in July via barge from Vancouver, Washington. The design vessel is 35 feet tall and 16 feet in diameter with a total capacity of 22,000 gallons. Testing will begin by the end of 2016.

Mecal Seppalainen, Board, asked Sahid if any other vessel shapes were considered. Sahid said they did review five or six other designs, but believe this shape is the best overall.

Mecal asked Steve about tanks that had already been purchased and will need to be replaced. Steve said they are already considering re-purposing these tanks for different processes, if feasible.

Steve said ORP will need an increase in funding in order to continue tank waste retrievals and to begin vitrifying some waste in 2022. The President's proposed budget for fiscal year (FY) 2017 recognizes this increased need, and increases funding for tank farm activities by about \$70 million, while funding remains stable for WTP construction and technical issue resolution. The proposed increase continues a trend over the past few years where ORP's budget has increased from \$1.09 billion in FY 2013 to \$1.414 billion in FY 2016.

ORP created a forum called the "Grand Challenge," where contractors, lab employees and stakeholders can bring creative ideas forward for consideration and discussion. It was started by ORP Manager Kevin

Smith about three years ago. Ideas are evaluated for their potential to make a significant difference in ORP's mission. Winning proposals are considered for implementation. There were 34 entries and 10 finalists evaluated this year. The 2015 winning proposal, covering the direct-feed vitrification of high-level waste, is being studied by ORP for potential implementation.

Steve added that the goals for the Grand Challenge include improving worker safety and reducing worker exposures. ORP is seeking cost savings of \$250 million or more in-direct savings, cost avoidance, or mission efficiencies.

John H. asked Steve how many people work in the Tank Farms and are potentially at risk from the vapors. Steve said approximately a few hundred people out of a thousand employed by the contractor.

New Staff at Washington Department of Ecology

Randy Bradbury introduced himself to the Board. He is the new Communications Manager for the Washington State Department of Ecology. He was recently hired and previously worked in the aviation advertising industry as well as print media in Wichita, Kansas.

Direct-Feed LAW

Wendell Wrzesnski, the direct-feed-LAW (DF-LAW) Program Lead at ORP, provided an update to the Board. Wendell said DF-LAW provides the first step in a sequential approach to tank waste treatment and disposal, and provides the earliest opportunity to begin vitrifying Hanford's tank waste. This will also provide a great learning experience for when they eventually bring high-level waste treatment on-line.

ORP's expectations for the DF-LAW program are that over a 10 year period, they will conduct 20 campaigns involving about a million gallons of waste each. The goal is to produce five containers of waste each day, or about 12,000 containers during the 10 year period. This would free up about 6.3 million gallons of tank space.

Some of the facilities that are needed to operate DF-LAW are already complete, though modifications or additional permitting may yet be necessary. For example, the Integrated Disposal Facility, where the waste canisters will be buried, was completed in 2006. However, some upgrades and new permitting is necessary before it can be used. Construction of the Analytical Laboratory was substantially completed in 2012, but some equipment must still be purchased and installed.

The LAW vitrification facility is the largest and most complex of the facilities needed to support DF-LAW. Construction is 56 percent complete overall, and is on schedule for completion by FY 2018. A new effluent management facility and a new pre-treatment facility are both in the design stages.

Representative Jeff Reardon asked Wendell about the overall degree of confidence in the schedule. Wendell said that it is "all hands on deck," but he couldn't give a ballpark percentage of what his degree of confidence is right now.

Steve said the LAW pre-treatment facility is the key part of this and is on schedule. Target date for construction completion is 2021. While they may not make the 2021 date, he does expect ORP to meet a Consent Decree Milestone of vitrifying LAW by 2023.

Mecal asked if ORP still has no plans to build new tanks for additional storage or transition. Wendell responded by saying that they are not planning on building any more tanks for storage, but they may need some new tanks for staging or characterization work when they begin work with the high-level waste stream.

Senator Richard Devlin asked Wendell to remind him about where the waste containers will go once they are filled with waste. Wendell said that LAW containers will be buried in the Integrated Disposal Facility, which is somewhat similar to ERDF.

Ken asked if you don't make your 2023 start-up, what most likely held you up?

Steve said several things keep him up at night, like getting operations started, equipment that is antiquated, things taking longer in startup, unexpected delays. Steve said they are reaching out to different DOE facilities for their lessons learned in complex projects.

John Price, Washington Department of Ecology, commented that one of the major tasks that is often overlooked is the extensive amount of permitting required for these facilities. He said DOE doesn't have much room in their schedule to allow permitting delays.

Hanford Tank Integrity

Jeremy Johnson, DOE-ORP Deputy Federal Project Director for the tank farms, provided the Board with an update on work done to assess Hanford's tanks, especially the double-shell tanks (DSTs).

DOE has been conducting ultrasonic testing, visual inspections and other analysis of the DSTs for more than 20 years. There have also been a number of expert panels that have looked at the tanks.

Jeremy explained the integrity process that has been adopted for the DSTs. He shared a chart with information on each of the DST tank farms, showing when they were constructed, their anticipated design life and their years in service.

The DST Integrity Program is intended to: maintain the DSTs to safely store and transfer 56 million gallons of high-level waste for treatment; extend the life of the DSTs to support WTP operation; monitor tank integrity to inform decisions for repair or replacement; monitor tank corrosion; and meet RCRA requirements.

Activities that help with this program include: ultra-sonic testing, which started in the 1990s to verify the thickness of the steel tanks and identify erosion or cracking; visual inspections, through use of cameras; and waste chemistry sampling and adjustments for corrosion mitigation.

Structural integrity analysis is conducted to ensure that both the DSTs and single-shell tanks are sound. This is required by Washington State Administrative Code.

DOE contractors conduct visual inspections every two weeks of DST AY-102, the tank which leaked from its inner shell and is in the process of being emptied.

In 2016, an Independent Qualified Registered Professional Engineer (IQRPE) conducted an assessment of the DSTs. This report had 24 recommendations and no findings of great significance. The report concluded that the DST system is fit for use for the next 10 years.

Ted asked Jeremy about a June 20, 2016 letter from the Washington Department of Ecology, in which they express concern to DOE about whether tank AP-102 is fit for use due to thinning. Jeremy said the IQRPE addressed some of their concerns and they are addressing them with Ecology. Jeremy added that they expect to have more information within a month, but he doesn't expect it to change the findings.

There was considerable discussion about how DOE went about the process of choosing an "independent" engineer and ensuring they had no formal relationship with DOE or its tanks contractor.

There is a Tank Integrity Expert Panel, which is comprised of experts from a variety of private and government organizations including the Savannah River National Laboratory and Pacific Northwest National Laboratory. The panel meets twice a year to provide independent advice and recommendations to DOE and its tanks contractor on existing emerging tank integrity issues.

Jeremy said the summary of current expert panel recommendations include: continuing existing corrosion and refractory testing; obtain a sample of the waste in the AY-102 annulus to determine corrosion threats to the secondary liner; utilize remote inspection techniques; confirm the secondary liner integrity of AY-102.

Mecal noted that the design life for AY-102 expired in the mid-1990s and asked why the tank continued to be used. Jeremy said if they had known then what is now known, DOE wouldn't have relied on the integrity of this tank, especially with the construction information they have obtained.

John H. noted that between 1976 and 1977 the design life of the tanks went from 20-25 years up to 50 years. He asked what accounted for that – whether the tanks were made of thicker steel or steel that was more corrosion resistant. Jeremy did not know the answer but promised to get back to the Board.

Ultrasonic scans were conducted on the bottom of the secondary liner in seven DSTs. Liner thinning greater than 10 percent was observed in all but one tank in a localized area. One tank was found to have

a small area with up to 70 percent thinning. This thinning was observed in tanks with no prior leak detection pit accumulation, and no indication that primary DST containment is affected.

AP-102 is the tank that had the most severe thinning. One area that was surveyed showed an average loss of 24 percent of the steel's thickness, with a small area showing 70 percent loss of thickness.

Jeremy said DOE plans to accelerate the ultrasonic floor scans; prioritize DSTs based on intrusion history; develop capability for increased floor scan area and implement new technologies; and conduct additional inspections and corrosion testing.

Kristen asked Jeremy how often DOE intends to scan the tanks. Jeremy said the plan is to scan each tank every 10 years, but if they find degradation, they would scan more often.

Jeremy said that there were some discussions about perhaps welding something over the area with the 70 percent thinning. For now, DOE is trying to decide how widespread the problems are rather than take immediate actions. They will not wait 10 more years to scan the same spot.

Jeremy said that after AY-102 is emptied and inspected, perhaps that will provide new information as to the integrity of not just that tank but others as well.

Public Comment/Adjourn

Sharon Monteiro asked if there is any information about tanks at other locations, like Savannah River that might be useful. She also had concerns about Tank AP-102.

Kristen adjourned the meeting for the day at 4:05 p.m.

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Tri-Party Agencies:

Mike Cline, U.S. DOE-RL
Tom Teynor, U.S. DOE-RL
Rich Buel, U.S. DOE-RL
Jennifer Copeland, CH2M Hill
Dale McKinney, U.S. DOE-RL
Dennis Faulk, U. S. EPA
Scott Sax, Washington Closure Hanford
Peter Bengtson, Washington Closure
John Price, Washington Department of Ecology
Randy Bradbury, Washington Department of Ecology

ODOE Staff:

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

Hanford Public Involvement

Kristen reviewed the results of a Hanford Public Involvement survey she had sent to Board members. She wanted to spark a discussion about how to better involve the public in Hanford issues. Past Governors' letters to the Board have repeatedly listed that as a goal.

Kristen received 13 responses to the survey. The results showed that the Board members find the Cleanup Board meetings very useful; Board members rely on ODOE staff for a lot of their understanding

of what's going on at Hanford, though newspaper articles also are helpful; and Board members do not rely much on social media for Hanford information.

In response to the question of "what makes it hard to inform other Oregonians about Hanford," many responded that it seems hard to maintain interest in a topic that just goes on and on.

There was some possible interest among Board members in making Hanford presentations if they were provided presentation materials such as a PowerPoint presentation. Some members were willing to work with ODOE staff to set up presentations for them to present. There were also comments about the difficulty in getting people interested and getting them to attend meetings or comment on cleanup issues. Board members need Oregon-specific information to demonstrate the relevance to Oregon.

Dennis Faulk, U.S. Environmental Protection Agency, said he feels the void in public participation activities with Columbia Riverkeepers and other citizen groups because they are not getting state funding that they used to.

John Price, Washington Ecology, said his agency had provided funding through Public Participation Grants to a variety of environmental groups. Due to budget issues, the Washington State legislature eliminated that funding for the current biennium. Columbia Riverkeepers was one group that had to cut one position because of this lack of grant funding.

As far as what might help communication, there were suggestions for informational DVD's or handouts or fliers with talking points for meetings. Another suggestion was to encourage people to join specific distribution lists. The Board members would also benefit from having specific, concise information linking Hanford to Oregon.

Frustrations that were noted include the slow pace of cleanup, lack of communication, long permitting processes, reduced funding, and lack of accountability regarding the WTP delays.

For possible actions, Kristen suggested developing a one page information sheet about Hanford's impact on Oregon, encouraging more public comment and letters to the congressional delegation.

John P. said if the Board thinks Public Participation grants are important, they should convey that thought.

Representative Reardon said he finds it hard to talk about Hanford because there is too much information. He shies away from it because he can get over his head very quickly. He supports the one page talking points. He said it is hard to make Hanford simple, but it's what we need to do. Lori added that you need to make it personal to make people consider it and take an interest.

Ken says ODOE can help with a lot of this by adapting existing printed materials.

Meme said Oregon interests are in-line with values of environmental preservation. There is an opportunity to tap into that in our state.

Lori added that you can't use blanket statements because depending on where you live in Oregon the issues are quite different (river impacts versus transportation impacts, as an example).

Dennis said that the most influential comments to regulators and DOE are when they are simple. Agencies can get that. When you get 55 pages of comments it's hard to sort through what is important.

Ken added that ODOE staff are available throughout the year to make presentations. If you can get an audience, we can come talk to them about Hanford.

Ted Taylor, Board, suggested that a lot of this engagement should be fairly informal. As an example from his past at Los Alamos, he gave lots of presentations, but what worked well were what they called 'Availability Sessions.' Ted said at first only a few people attended, but if you just show up repeatedly people will come.

Meme says you need something for people to do with the knowledge they gain, and those options are fairly limited.

As far as engaging young people, Kristen suggested those members with kids should talk to them about what would get their interest.

Randy suggested finding a college communication professor, and have that person assign their class a project like a communication strategy for Hanford or nuclear waste.

Sharon Monteiro, public, suggested creating a project where you invite people to help develop a message for kids, as it's a challenge to get kids engaged. After the election she'd like to see the Board put feelers out to get younger people to help you create a concise message.

Meme said Alex Sager taught a class at Portland State University for one term. He focused the course on Hanford. Part of the big attraction was going to a HAB meeting in Portland and a tour of Hanford itself. People were into it because it was a real thing that they could visit. But then the HAB meetings stopped coming to Portland. She said that may not be only reason he stopped, but attention waned.

John P. that he and other Ecology staff visited high schools as part of their outreach for Ecology. Some people at Ecology may take that on again.

Kristen thanked everyone for an involved group discussion. Board members are encouraged to talk to people, especially younger Oregonians, about how they learn about new things. Kristen will prepare a survey to capture what board members have learned.

Plutonium Finishing Plant Status

Tom Teynor, DOE-RL, provided the Board with an update on the Plutonium Finishing Plant (PFP) closure project.

Work began to clean out the facility in preparation for demolition 20 years ago. Now, they are within weeks of beginning the first of the building demolition activities. Tom said there are still a number of key risks that could impact the schedule and delay progress.

- If a significant number of bargaining unit employees at PFP are replaced due to bump and roll, retirement or other personnel action, schedules could be impacted. That's because the specialized training required for the workers is so extensive and takes a long time. This has been a repeated issue at PFP in past years.
- Aging equipment within the facility could break down or have a catastrophic failure. As an example, they have repeatedly had to fix the crane within the facility.
- If a key stakeholder raises a significant safety or other concern, work could be interrupted.
- If airborne contamination is spread during the demolition, that could impact the schedule.

Almost everything has been removed from the facilities in preparation for demolition. The floors have been coated or grouted, the walls were pressure washed and then a fixative was applied. Workers have removed more than 26,000 square feet of asbestos insulation and extensive fogging, water suppression and fixative will be used to control beryllium and radiological hazards.

DOE and its contractors did have to slow the work down, as there were too many high risk jobs going on at once – all of which required the most protective personnel equipment. Instead, they will do one at a time.

Tom said that the contractor is using experienced demolition experts to plan the stages of building take-down.

As demolition takes place, protective zones will be set up, including an area anticipating where winds might carry materials. There will be extensive air monitoring and groundwater monitoring during the demolition.

Demolition on the Plutonium Reclamation Facility is scheduled for October 2016 through February 2017. The McCluskey room would be demolished in February. The main processing facility would be demolished from March through July 2017. The Fan House and Ventilation stack would be demolished during that same time.

Most of the building debris will be buried at ERDF. The remainder is transuranic waste and will eventually be going to WIPP.

Representative Reardon asked whether it is difficult keep the workers. Tom replied that DOE and the contractor have been working to ensure that most of the workers have other jobs lined up once their work at PFP is completed.

Once the PFP complex is demolished, there will be sampling to determine contamination left in pipelines, waste sites, and the sub-floor structures. There are Tri-Party Agreement milestones in place that will guide much of this work.

Groundwater Update

Mike Cline, DOE-RL, next provided the Board with an update on groundwater cleanup at Hanford.

Mike said there are currently five pump-and-treat facilities operating along the River Corridor, and a much larger facility operating in the 200-West Area. The capacity for each of these systems has been expanded beyond its original capacity. The use of more effective resins to capture chromium in the river corridor is responsible for much of the improvement.

Two smaller pump-and-treat systems in the 100-K Area have a 330 gallon per minute capacity, and a third system in the K Area has a 900 gallon per minute capacity. A pump-and-treat system in the 100-D area has a capacity of 775 gallons per minute, and one in the 100-H area has a 900 gallon per minute capacity. The 200 West pump-and-treat system now operates at a capacity of 2,500 gallons per minute.

Dale Engstrom, ODOE staff, noted that hexavalent chromium is deadly to fish, clams and other aquatic life in the river.

Mike said in the last five years, they have made substantial progress in the “horn” part of the site, where the D and H areas are combined into one groundwater operable unit. In the D Area, they’ve expanded the number of extraction wells from five to 46, and are now treating over 1.4 million liters of groundwater. The average chrome concentration during that time has gone from 1,750 micrograms per liter to 53 (the drinking water standard is 48, the aquatic standard is 10).

Similar results have occurred in the H Area. Extraction wells have increased from 12 to 35 and they are treating more than 1.1 million liters of groundwater each year. Average chrome concentrations have shrunk from 122 micrograms per liter to 23. The plumes have also been greatly reduced in size and no longer connect between the two reactor areas.

There was a brief discussion related to when sampling is conducted in relation to river stage and how aquifer tubes are used.

Similar results have occurred in the K Area, with the three systems combined treating nearly three million liters of groundwater per year, and the average chrome concentration decreasing – substantially in some cases – throughout the K Area. The plumes have also been shrinking and moved away from the river in most locations.

Mike said that they have shut down the KW pump-and-treat system and are watching to see if the levels rise again as vadose zone chromium could move into the groundwater. So far it has not.

In the N Reactor area, the main contaminant of concern is strontium rather than chromium. A pump-and-treat system helped contain the plume, but didn’t do much to clean it up. That was shut down a few years ago. Instead, DOE is trying to immobilize the strontium through the installation of a chemical barrier in the area. A calcium-citrate-phosphate solution was injected into the ground along the river

shoreline to form a mineral barrier called apatite. Strontium binds to the apatite and the strategy is to leave it in place to decay.

A 762 meter long barrier (approximately ½ mile) was planned along the shoreline, involving 162 injection wells – all of which have been drilled. Currently, only about 300 meters of the barrier have had the apatite injected. Mike explained this area is culturally sensitive to the Native Americans and they've had to work through some concerns before expanding the barrier.

David Close, CTUIR and Board, asked about the efficiency of the apatite and the extent of monitoring. Mike said they are working to determine how efficient the barrier is and expanding sampling. From the test area they know the barrier is efficient, though some wells may need reinjecting. The timing of injections is critical – they prefer spring when the water table is high to get broader soil dispersion.

In the 300 Area, they are using a different kind of chemical to bind uranium in the soil. Phosphate solutions have been injected into a .75 acre test stage. A further 2.25 acre expansion is in the planning stages.

Early results show a decline in uranium concentrations to below the cleanup standard. Mike said they believe this test shows success, though they will continue to monitor as well as make some changes in how the phosphate is dispersed.

Dan Solitz, Board, asked where the uranium came from. Mike explained there were process waste trenches in the area.

Dale commented that he was not yet convinced that the sequestration will ultimately be successful and the uranium will be remain bound.

Mike wrapped up his presentation by talking about the 200 West pump-and-treat facility. It has been in operation since 2012 and has about a 25 year expected life. In the case of this pump-and-treat system, they pump from the center of the plume and re-inject on the periphery to push contaminants towards the extraction wells. Along the river, they tried to create a capture zone.

Mike showed a map of the various groundwater plumes in the Central Plateau, including carbon tetrachloride, chromium, iodine-129, nitrate, technetium-99 and uranium. They have gradually added treatment capability and have expanded the well network into the 200-East Area. They have also been able to increase the capacity of the facility.

David noted that there is a long history of these pollutants going to the river and dosing aquatic life. Even though things have improved greatly in recent years, he expressed concern that there could be a legacy of genetic damage. He noted that sturgeon are a long-lived species.

John P. said that Washington looked at seven species of sturgeon. John will get Dr. Close a link to that report.

Ken noted the big digs to remove chromium in the 100-B/C area and that DOE has been studying the area to see whether pump-and-treat or other treatment will be necessary. Mike said they don't believe it will be necessary in the B/C area.

David commented that the tribal concern along the river is high – not just for fish, but also for plants and roots which are used as foods and medicines. He said they expect a disproportionate exposure to tribal peoples and the resources. Tribes still want to exercise their Treaty rights on the river and in the river.

Washington Closure's Hanford Work

Scott Sax, President of WCH, provided a detailed presentation to the Board on the accomplishments of WCH as their 11 years at Hanford are coming to an end.

Scott said the scope of their contract was enormous – remove hundreds of excess nuclear facilities; place deactivated plutonium production reactors in interim safe storage; clean up waste sites and burial grounds; and manage ERDF.

WCH received a \$2.9 billion cost-plus incentive fee contract. He said WCH did not miss any of its 51 Tri-Party Agreement milestones. Through cost efficiencies, WCH saved the government \$300 million and was able to pay bonuses to employees for being under budget and ahead of schedule. Workers were incentivized to look for ways to save money.

In all, WCH deactivated, decontaminated and demolished 324 facilities – some of them highly contaminated. They treated, transported and disposed 11.9 million tons of waste to ERDF. And they cleaned up and closed 578 burial grounds and waste sites.

Scott said this was accomplished while facing a number of risks and hazards: not just radiological hazards, but also chemical hazards, including asbestos, beryllium, and mercury; discovery of unexpected waste sites; high-dose fuel elements and other reactor parts; unexploded ordnance; and pyrophoric uranium oxide drums.

Each of the areas along the river presented unique challenges. In the 300 Area, it was 179 buildings and supporting infrastructure crammed into a fairly small area, along with numerous burial grounds.

In the B/C and D Areas, WCH chased chromium plumes 85 feet deep to groundwater. In the N Area, structures had to be removed from the river without harming salmon beds.

Scott called ERDF the “hub” of the site's waste disposal. It has taken 18 million tons of waste so far, including more than two million tons of chromium laden soils. ERDF is as big as 53 football fields.

Following cleanup, considerable revegetation and wetlands restoration work has been accomplished. More than 1,100 acres along the Columbia River have been restored since 2012, including 30 acres of wetlands.

The 618-10 burial ground has challenged WCH as much as any site. Workers did devise a way to remediate the vertical pipe units and successfully remediated far more than was expected before its contract expired. The large number of barrels also posed challenges, and workers initially had a number of incidents where contamination spread beyond the borders of the waste site.

At the 324-building, WCH devised a method to deal with the concentrated contaminant source under the building. That work now transfers to CH2M-Hill Plateau Remediation Company.

Scott said company managers and employees learned to celebrate their success in what is an otherwise negative environment where successes are somewhat rare. They developed a qualified work force and have successfully placed nearly every worker that wanted to continue working once the contract expires.

Ken asked Scott to share his biggest regret. Scott said he really wanted a three year contract extension to finish the 618-10 burial ground and the 324 building. WCH had already solved the technical problems.

Ken asked how DOE could write its new contracts to mirror the success of the WCH contract. Scott said DOE needs to make them cost-plus incentive fee contracts that reward saving money and time.

Dan asked Scott what advice he had for the WTP. Scott said “get started with it. Find a way to make it happen – this DF-LAW solution will get production going, and the rest will just be another step in the process and not a beginning.”

Board Business

The Board set the next meeting for January 23 and 24 in Hood River.

Mecal agreed to continue to be an alternate to the HAB until someone else is interested.

Public Comment

Sharon Monteiro expressed numerous concerns about the condition of Hanford’s underground storage tanks. She said she heard today that the public demanded that the groundwater be cleaned up, and it was started. She asked the Board to stand up for the people of the Northwest to start to deal with the leaking tank problem and not to count on the answer of radioactive glass.

Kristen adjourned the meeting at 12:26 p.m.