

**FINAL MEETING SUMMARY**

**HANFORD ADVISORY BOARD  
TANK WASTE COMMITTEE MEETING  
October 7, 2008  
Richland, WA**

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*This is only a summary of issues and actions in this meeting. It may not represent the fullness of ideas discussed or opinions given, and should not be used as a substitute for actual public involvement or public comment on any particular topic unless specifically identified as such.*

**Welcome and Introductions**

Larry Lockrem, Tank Waste Committee (TWC) Chair, welcomed everyone and introductions were made. The committee approved the August meeting summary.

**Pretreatment Engineering Platform**

Rob Gilbert, Department of Energy – Office of River Protection (DOE-ORP), provided a progress update on the External Flowsheet Review Team M-12 Response Plan including the Pretreatment Engineering Platform (PEP). Rob said DOE-ORP identified issues with the pretreatment ultrafiltration process (UFP) in 2004. An issue response plan was prepared in 2006 to address: prudent changes in modeling, waste characterization by creating composites of hundreds of samples of waste, simulant development and testing, and engineering scale testing for PEP. Rob said the testing objectives were designed to confirm the UFP system design and sludge treatment process flowsheet. The testing used prototypic operating strategies for aluminum leaching, washing, solids concentrations, and chromium leaching to ultimately reduce the number high level waste (HLW) canisters.

Rob reviewed the PEP simplified flow diagram and provided an update on the status of the testing. The contract was awarded to URS Corporation in January 2007. PEP was installed, tested and operated by Pacific Northwest National Laboratory (PNNL) from January through May of 2008. Testing with a simulant is planned for late October 2008,

and integrated testing is to be completed by the end of calendar year 2008. Rob shared some pictures of the PEP facility and pointed out key elements. The benefits of the testing have led to: an improved heating method for leaching vessels, relocation of pump suction line in ultrafilter feed vessel, added in-line mixing capability to enhance mixing of reagents and waste, identification of a failed ultrafilter tube in original Waste Treatment Plant (WTP) ultrafilter bundles, improvements in controls and instrument design, improved ultrafilter flushing, and accelerated focus on ultrafilter vessel corrosion issues.

### **Regulator Perspectives**

- Ed Fredenburg, Washington State Department of Ecology (Ecology), said Ecology supports the testing effort and commitment from DOE to do this work and find problems now before WTP starts up. Ed said he has been out on three tours of PEP and appreciated DOE's willingness to allow regulators to go out and see what is going on. Ed explained that the Phase 1 testing will confirm process design assumptions. Ed said Ecology is encouraging DOE to do a Phase II testing to test optimization of the system and minimize impact of sodium addition which will be an issue in supplemental treatment. Ed said DOE has invested approximately \$80 million in this project so far, and Ecology thinks it would be prudent to keep this system going in case they run into problems when the plant starts up.
- Ed asked about the issue with filter fouling from microbes in the tanks. Rob said the testing to date has been done with water; the water introduced microbes that will need to be flushed from the system. Ed asked if DOE is considering switching the ultrafilter vessels from stainless to Haselloy to avoid corrosion issues. Rob said that the ultrafiltration vessels should not be susceptible to caustic stress corrosion cracking if the vessels are operated under 90 degrees centigrade (C). Ed asked if DOE is confident that there is enough design margin to keep the operation under 90 degrees. Based from the performance testing, Rob said ORP believes they can keep the mission time and duration the same while operating under 90 degrees. Rob said Bechtel National Inc. has recommended additional testing at 90 degrees to confirm this. Rob said the cost of replacing the vessel would be \$70-80 million and would have a two year impact to the project. Ed said leaching at lower temperatures could increase the duration and will put constraints on the amount of processed material. Rob said Bechtel completed a modeling study that concluded performing caustic leaching at 90 degrees would have a minor impact to HLW canister production: approximately 200 more out of an estimated 13,000 cans total.
- Ed said the decision to stick with stainless vessels should not just be based on avoiding delays in the start of operation but should also consider impacts to completion of operations. Ed said if not changing to Haselloy will result in running the plant longer, it might be worth the construction delay to switch. Ed said there is some speculation around Bechtel's estimate of 13,000 cans. Rob said the estimate comes from Bechtel's glass model. Ed thought that number could be reduced by optimizing blending. Ed said that if better retrieval technology and operating practices are adopted so that waste retrieval is no longer a constraint, it would be unfortunate to then find out the constraint became the long leaching times because of this

temperature limit. Rob said the model indicates that at times different WTP systems are limiting throughput; Rob thought this shows that the plant is reasonably balanced in design. Rob offered to share the report with Ed so he can evaluate the model used.

### Committee Discussion

- Susan Leckband asked if the PEP elements located outside could be affected by the weather. Rob said the water system has antifreeze and the air compressor will be okay in the weather. Rob thought that if the equipment ends up staying longer than it was intended for the testing, then they will have to re-evaluate impacts.
- Susan asked if there were any overarching problems identified through testing that would push out the schedule. Rob said the key lessons learned are captured in the presentation and ORP is responding in real time. Rob said the current schedule accounts for everything they learned through testing, but they may encounter new obstacles that they will have to address.
- Maynard Plahuta asked how the lessons learned have impacted the anticipated costs of building and operating the facility. Rob said all of the additional costs have been factored into the design. Rob said if the ultrafiltration vessel heating issue had not been discovered it would have impacted the cost dramatically to replace after the system is installed. Maynard asked if the costs are significantly more than what was originally anticipated. Rob said the testing cost more than they anticipated. Some of the lessons being learned have a cost impact to the WTP project but the cost avoided to correct an issue later is more than offset by the cost to optimize the design today.
- Dick Smith asked if the vessels for the pretreatment plant are already fabricated. Rob said the ultrafiltration vessels are currently in a late stage of fabrication and are on hold pending design changes to address seismic criteria and heating approach; they are around 70 percent complete.
- Dirk Dunning asked what the life expectancy is for the ultrafilter vessel if they have to be operated at 90 degrees C in order to avoid corrosion. Rob said they need to do additional testing to confirm the margin for operating temperatures should a temperature excursion occur. The vessels are expected to last the life of the plant if operated below 90 degrees C. Dirk asked if it is a life effect or a threshold effect. Rob said it is a threshold effect. Dirk asked what happens to manganese in the process. Rob said manganese reports as a solid and ends up in HLW glass. Rob said they are oxidizing the chromium in the plus three oxidation state to chromium in the plus six oxidation state. Dirk warned that trading one for another may have an impact.
- Bob Suyama asked if there is a point in the schedule where the results from the testing will impact the critical path of the vitrification plant. Bob expressed concern that the testing might produce a major redesign. Rob said the work is intended to be confirmatory. ORP will need to get results from the testing before midyear 2009 to support procurement of equipment for the vitrification plant. Rob said they do not expect to see a lot of change to vessels themselves.

- Al Boldt said the temperature problem in the vessels creates extended leach times. Al asked what the impact will be to the HLW. Rob said their model did not show an appreciable impact on HLW.
- Larry had asked if the PEP simulant testing was done with a composite simulant that was representative of the multiple components in the waste. Rob said the simulant was based on extensive preliminary testing of actual radioactive tank waste samples. The formulated simulant to be used in the PEP testing is primarily for filtration and caustic leaching. He said the simulant bounds around 80 percent of the actual waste based on the amount and type of aluminum required to leach. The chromium component will be added to the simulant in the engineering tests following caustic leaching testing. Rob described the lab testing procedures for ultrafiltration.
- Al said that he has seen an issue with stainless stress cracking because of corrosion. Al recommended designing in a failure point and having someone examine the tanks and pipes for this issue.
- Mike Korenko agreed temperature is important because of stress cracking. Mike said he has found that each degree of temperature makes a big difference. Mike said he was glad to see that DOE is doing a project management plan for this work. He said he has seen projects fail because they did not do this planning work. Mike thought the project management plan helped save money by identifying issues early and having a risk mitigation plan in place.
- Dirk asked if Rob was using any form of chemical treatment to passivate the metal surfaces to minimize rusting. Rob said he did not know the fabrication requirements for the filters and could not speak about the vessels directly. Rob said every place there is a mixer in the vessel, there are corrosion evaluations being done and the ultrafilters can be replaced.

Rob said evaluation of testing to support closure of the undemonstrated leaching process issue will be complete by March 2009. The committee requested a follow up report after March.

### **Secondary Waste Roadmap**

Billie Mauss, DOE-ORP, distributed the first two chapters of the secondary waste roadmap report. Billie said these chapters describe the process from which DOE-ORP came up with a roadmap for secondary waste. Billie said Larry Lockrem and Dirk Dunning, along with others, participated in this process. Billie also distributed a flow chart of the roadmap outlining the path for the overarching roadmap. She said that regulatory and performance requirements will be needed within the process so DOE can obtain preliminary waste form screening. Billie said DOE-ORP can consider anything from ceramic waste forms to steam reforming during the preliminary waste screening. Billie said testing and waste forming is expensive so they need to pare down the options before going through validation and process design support to come up with an effective waste form.

Billie said DOE developed a process that all participants could agree on. She said they held a workshop to gather stakeholder input on the development process and the products are still coming out. Billie said this development effort was supported by Environmental Management (EM) 21 at headquarters (HQ). DOE-ORP hopes to utilize some of EM's funding to follow up on this work. Billie said developmental work has been done in the past with CH2M Hill Corporate, Mississippi State, and others, but it has always been done in pieces. The secondary waste roadmap process will be a coordinated effort.

### *Regulator Perspectives*

- Ed said during the workshop, the group talked about how this process links to programmatic decisions. Ed said the first critical decision will be an early low activity waste (LAW) pretreatment system. The group also looked at upgrades to the effluent treatment facility (ETF) which would take a minimum of six years. Ed said it seems like DOE is backing off of interim pretreatment, and the group talked about accelerating the process to come up with performance criteria to support the interim pretreatment system (IPS). Ed said DOE and the regulators have not sat down to come up with performance criteria yet, but they need to have that discussion. Billie agreed, she said the focus was near-term on supplement treatment or early LAW; but the long-term baseline needs to be looked at as well. DOE is trying to get ahead of the curve and understand what is needed to do an upgrade.

### *Committee Discussion*

- Larry asked who is responsible for technology development within the tank farm contract. Billie said currently Herb Berman will be the chief engineer and has hired a technology manager, Rubin Mendoza. Larry asked if anything would move forward on the secondary waste streams given that EM20 funding is limited for 2009. Billie said probably not with the continuing resolution. DOE-ORP has done a preliminary analysis of the lines that are being screened. She said she did not know where the budget would come from at this point.
- Larry asked what the timeframe is for the fractional crystallization (FC) final report. Billie said she thought the report is almost done, but said that work falls under Ben Harp's program. Larry said he thought FC was being evaluated as an alternative technology to ion exchange and inquired as to whether any funding would be provided on a parallel path to the ion exchange technology under the EM 20 program. Billie recommended Larry ask Ben about that work.
- Al said the document does not address making changes to processes feeding secondary waste. He said the process does address the scrubber liquids to ETF. Al said when a decision was made years ago to reduce the scrubber liquids, no one thought about what else would be sent to ETF. Al said the site has operated for 60 years by only sending process scrubbing condensates; DOE has not evaluated this to see if it can be mitigated. Billie said the scrubber stream is being recycled. Al said the facility includes an evaporator which should be utilized. Billie thought Ben Harp could address this issue better. Al said the recycled condensate from LAW is

supposed to go back to pretreatment. Al suggested going back to evaluate why the stream exists and deal with the issue at its source. Billie recommended that someone from ORP brief Al on the flowsheet because she thought some of those changes have been made.

- Mike asked if the flowsheet and alternate waste forms consider taking technetium out of the waste stream. Billie said they have discussed the issue of removing contaminants of concern, iodine and technetium, so they do not drive the waste stream; however there is no methodology yet. Larry said the technetium issue concerned the regulatory requirements for the Integrated Disposal Facility (IDF) and Environmental Restoration and Disposal Facility (ERDF). Mike asked if technetium is still an issue. Billie thought it is less of an issue, and iodine is more of a risk driver. Mike said he thought grout was not acceptable for low level waste because of technetium. Larry said that studies being evaluated to capture the technetium. The study should be available in 2009. Billie said grout is the baseline, if more needs to be evaluated, the flow sheet will be useful in determining next steps.
- Ed said Ecology does not agree that technetium is not a problem. He said Ecology has not seen the report, but looks forward to seeing it once it is available. Ed thought this underscores the importance of agreeing on some tentative performance criteria so everyone can look at waste forms and see how they will affect a secondary waste treatment facility. Susan asked if Ecology has diverted from the “as good as glass” criteria. Ed said they have not.
- Pam Larsen asked if ETF transferred under the new contracts. Billie said CH2M Hill Plateau Remediation Company (CHPRC) has ETF. Pam said there is language in the Defense Authorization Bill recently signed by President Bush that authorizes EM sites to move forward on unfunded liabilities. Pam said if the path forward is not funded under the new contract, DOE-ORP might look into this bill to see if there may be funding to carry forward from 2008.
- Dirk cautioned against designing a release rate around a standard like the drinking water regulations; he said the release rate should consider the differences between the regulatory period versus the long-term hazards. Dirk thought it was important to look beyond the regulatory period into the length of time these contaminants will remain hazards; which Dirk thought should mean these contaminants need to go into glass or go to Waste Isolation Pilot Plant. Dirk said DOE keeps looking at technological fixes to hold contaminants without considering that they cannot be held for the length that they will remain a hazard.
- Susan asked if Billie would like comments from the Hanford Advisory Board (HAB or Board) on the draft report. Susan also asked if there would be an opportunity for the Board to look at the technical decisions. Billie said that PNNL is producing the report, but with the contract change there have been some management issues that have held up the report. Billie clarified that the report is not intended to solve the problem, but to design a methodology to address the problem.
- Dick asked if Ed’s comments earlier were implying that early LAW or interim pretreatment is dead. Ed said he is passing on what he has heard from DOE-ORP. Ed

thought there is still a desire to start LAW early, but not as an interim pretreatment process.

- Mike said Hanford is an integrated system and this process is a subset of a larger system. Mike recommended the flowchart include a feedback loop. Mike thought the main issue is waste flow, and DOE may find out that there are other elements in the secondary stream which will exceed the waste criteria. Billie said the regulatory and waste composition does include feedback, and the permit will further define this. Mike said this issue was the primary problem in the contract, and this document does not reflect that. Billie said ORP recognizes there will be a transfer in the contracts and she is responsible for developing integration efforts with Richland Operations.
- Pam said the committee has followed this issue for a long time. Pam said Bechtel made the decision to take a \$60 million dollar piece of equipment out of pretreatment, and has probably spent that much trying to deal with technetium on the other end because of it. John Truax, DOE-ORP, said permit conditions for secondary waste will be released for public comment in the near future. John said there will be an option in the permit for WTP that requires DOE and contractors to look at options of secondary waste to address Pam's concerns. Madeleine Brown, Ecology, said the comment period for the permit starts in October and will go through December.
- Al said the document does not acknowledge the schedule for 2019 startup and several issues need addressing before 2019. Ed said Ecology asked that the activities be tied to key programmatic decisions that need to be made. Billie said this information came in last week, and she did not have the chance to make that change yet.
- Dirk said it seems like DOE needs to understand the problem from a policy level. He noted that DOE is making changes limiting their ability to deal with the contractor problems. Dirk suggested reviewing previous decisions such as contractor incentives to evaluate the process. Dirk also thought DOE needs to focus on the major issues of iodine and technetium to address what potential there is for a whole solution.
- Dick said he is pleased that DOE-ORP is recognizing the problem with the secondary stream. Dick said decisions made five years ago about WTP aggravated this issue. DOE recognized they had a problem with chromium only a couple years ago. He remarked DOE is focused on building band aids around the WTP system. Dick said he is discouraged that no one can influence the whole system of ideas that are being used to ensure a working WTP. Rob said DOE-ORP has done multiple WTP reviews and has made corrections resulting in many system improvements.

Larry suggested that once this document is issued the committee should form an issue manager subgroup to review the document and come back to the committee with a path forward. Mike Korenko agreed to serve as the issue manager on this topic. Dirk and Harold Heacock offered to support Mike on this issue. Billie said the report should be done by the end of October, but was not sure when it would be released given the transition between PNNL and Washington River Protection Solutions (WRPS).

## **Tank Closure**

Jeff Lyons, Ecology, provided an update on tank closure. Jeff said the Environmental Impact Statement (EIS) and the Hanford Site-Wide Permit are supposed to come out in the next six months. Both documents will include information on single shell tank (SST) closure. Jeff said he would like to address the desire voiced by committee members to hear about what decisions are being made, how they are made, and what input they can provide. Jeff distributed a presentation on Closure Process and Decisions. Jeff reviewed current retrieval efforts in C-Farm. He said DOE has almost emptied six tanks in C Farm by M-45 standards: C-108 and C-109 are partially empty, C-200 tanks, C-103 and C-106 are considered retrieved as required by M-45 milestone, and C-110 is planned to restart in the near future (C-110 was shut down during contract transition). C-101 and C-105 tanks are known leakers. The current retrieval method for these leaking tanks is a vacuum technology that uses a low volume of liquid within the tank. Current leak detection methods use a High Resolution Resistivity (HRR) to observe leaks at 1,000 – 2,000 gallons. Jeff said the Board should think about what process should be used to continue tank retrieval when it has leaked.

Jeff discussed the status of the Dangerous Waste Permit for Hanford. He outlined the SST closure section which consists of conditions to manage waste during retrieval and closure of Waste Management Areas (WMA), and a compliance schedule for things needed to implement closure. Jeff outlined the closure process in Washington Administrative Code 173-303-640. Jeff said there are two options for closure: clean closure or landfill. He said Closure Process 1 includes managing the waste under the Dangerous Waste regulations and developing key steps to meet requirements with the demonstration project. Closure Process 2 uses Resource Conservation and Recovery Act (RCRA) Facility Investigation / Corrective Measures Study process. Jeff said a data quality objective (DQO) process has been issued and is still receiving comments; a revised work plan will be issued in December. Under Closure Process 2, a closure plan will be developed between now and when DOE releases the EIS, and once all expectations are met, a final closure plan will be released. Jeff said the agencies currently do not have a timeline for closure. Jeff remarked the importance of timing the closure decision correctly since it involves many pipes, spills, catch tanks and buildings at C Farm.

Jeff described how the EIS will assist in tank closure activities and how Ecology has participated in the development of the document. Jeff said there is a core team of eight people at Ecology that have met with DOE regularly. Jeff said the EIS will meet the State Environmental Policy Act (SEPA) requirements and will allow Ecology to start looking at closure activities for tank farms and consider alternatives for waste management facility site locations and supplemental treatment for HLW. Jeff said DOE must consider all comments received on the EIS and respond to them. Jeff said the record of decision (ROD) should address closure and alternatives for supplement treatment. Jeff said the EIS is important because it provides Ecology with the information necessary to resolve the Settlement Agreement requirements from the previous solid waste EIS. The EIS will



not make permit decisions, TPA treatment decisions, or site-wide assessments on final cleanup. Jeff said Ecology will work hard to get consistency between the processes.

Ginger Wireman, Ecology, discussed her work with Jeff to develop a method for taking these closure issues to the public. Ginger said she went through the project demonstration plan and put together a plain language version for tank closure standards at Hanford as a citizen's guide for the public. Ginger distributed the citizen's guide for the committee to review.

Madeleine Brown, Ecology, announced that changed to the Dangerous Waste portion of the Hanford Facility Resource Conservation and Recovery Act Permit is out for public comment from October 20 through December 8, 2008.

Bob Lober, DOE-ORP, said the EIS is the first regulatory step in the closure process; it will establish system level closure plans. Bob distributed a flow sheet that outlines WMA C Closure Planning from DOE's perspective. Bob said DOE needs to identify how they intend to retrieve tank waste, collect data specific to WMA C, identify soil contamination, and develop options for closure and corrective actions as a first step to closure. Bob said understanding the extent of known leaks involves demonstrations. DOE will look at tank removal strategies and how to remove ancillary equipment. Bob encouraged the committee to participate in the demonstrations. Bob said DOE received comments from the HAB on the DQO. Bob said the comments need to be captured in the regulatory framework which will go into the closure plans and are implemented through permit modifications. Bob said that although closure may seem far away, there is a lot of work that has to happen early to get there. Closure will be defined and developed first by the EIS and then over the next six or seven years to lead toward the closure. Bob asked committee members to comment on EIS, closure plans, and permit modifications.

### *Committee Discussion*

- Pam said there was an issue a couple years ago about federal language needed to help close RCRA sites. Pam asked if the site still needs something from Washington to close tanks. Jeff said Idaho required the Nuclear Regulatory Commission (NRC) to participate in closure. Jeff said this is a political process, not a technical process. Bob said a determination is in order for DOE to move forward, and they are trying to figure out when that needs to happen before they can move forward. Pam said Hanford has the advantage of learning from Idaho and Savannah River's mistakes. Jeff agreed and said closure will be a 3-5 year process so DOE may need to start soon to successfully close a tank farm.
- Dick asked if there are criteria to determine whether waste was washed through the tank to the existing leak; Dick asked if DOE has a limit for the percentage that is acceptable (e.g. 5% or 8%). Bob said the current appendix process says DOE needs to look at how all of the leaks in the system are managed. They have mechanisms to get a handle on how the potential leak losses have impacted the system. Jeff said they have not done the exercise to say what percent is okay. The old and new contractors are working together to determine what a risk assessment (RA) should be. Jeff

thought that identifying the percent number that Dick is talking about would indicate that the agencies understand what the risk of that leak is. Jeff said if you are going to retrieve a leaker, you need to know the risks and a RA has to speak to that. Dick said this is especially true where the waste is left in the tank. Jeff agreed and said once it is in the soil it is more likely to get to groundwater; the insoluble part is left in the tank.

- Dirk asked how and when closure is integrated with the Natural Resources Damage Assessment (NRDA) process. Bob said the regulatory framework and process is in a state of flux. They have heard that NRDA should be integrated in early and they have tried to build the DQO into the natural risk assessment. Dirk said the dollar actions may change how far cleanup goes and what dollars are spent on all of these cleanup decisions. Bob said that is a good point and has been an issue discussed with the state of Oregon and the tribes.
- Mike discussed his closure experience at Rocky Flats. Mike said they started out frightened by the risk, but started making progress and it got easier. Mike said he is frustrated that DOE is working in the tanks through a 12 inch riser. Mike commented on bringing in commercial practices from the mining industry to address tank closure. Mike remarked that in the mining business, they would put a ten foot hole in the tank and bring in equipment to remove the contamination. Mike said he hoped the EIS and the new contractor would open up the possibility for new thinking on technologies and equipment already available.
- Larry commented on the role of politics in decision making at Hanford. He said in the 1990's the site was looking at an in-situ technology to support the ferricyanide tank program. A memorandum of understanding was set in place between the National Aeronautics and Space Administration (NASA) and DOE to evaluate potential technology. Due to politics and programmatic reasons, the technology was never utilized. Larry said that many technologies exist, yet sometimes they are ignored or abandoned for political reasons.
- Jeff Luke said he believes the EIS is required to look at clean closure which may address some of the issues that Mike raised. Mike feels that there has to be a better way to get the contamination out of the tanks then pushing around the stuff in the bottom of the tank; Mike said whether or not this means clean closure is a question he had not considered yet.
- Dirk said he was encouraged by this discussion about high level policy questions Dirk thought the real problem is the leaked waste in addition to the waste in the tanks. Dirk agreed that one of the solutions should be to open up the tanks and by sub-optimizing the issue, DOE is extending the length and cost of retrieval.
- Wade Riggsbee said what Mike and Dirk are taking about has been looked at by mining engineers and decontamination and decommissioning (D&D) experts at AX Tank Farm. The problem with this approach was what to do with the waste once it was retrieved and whether it was cost effective to do clean closure. Bob said Wade is referencing a report from 1999 on retrieval performance evaluation for A and AX Tank Farm. Mary Beth Burandt, DOE-ORP, said the AX Tank Farm report is the basis for what they are using for the clean closure alternatives in the EIS.

- Harold said this discussion presupposes a decision to remove the tanks and dirt in some form. Harold said the EIS may also look at leaving the tanks in place by grouting. Harold said the committee needs to keep all of these issues in mind and wait until the EIS is issued to think about how to comment. Jeff said the EIS will look at both leaving the tanks in place and removing them for clean closure. He said he is encouraged that the committee is thinking about the EIS and how to close a farm. Jeff said Mike's comments bring up a desire to show the public that the decisions made have a solid basis. Jeff said he thought this committee and the state of Oregon would be important players in coming up with a process for closure. Jeff said Wade was right about the issue of what to do with the waste from clean closure. He said if all of the soil was removed from C Farm it would fill up the old King Dome, and C Farm is a small farm. Mike said commercial decommissioning projects treat the soil that is pulled out of sites like this so you are not left with mountains of soil to dispose of. Mike said he wants to make sure all the ideas are considered, and the timing is great with the EIS coming out.
- Al thought closure of a farm should use multiple technologies. Al said there may be 12-20 tanks that should be removed to get at the soil contamination, but maybe DOE will not have to dig up all of the tank farms. Al suggested that DOE could drive pilings or use coffer dams instead at some tanks. Al said he hoped the EIS would look at mixed cases rather than all or nothing closure solutions.
- Dirk commented on implementing an integrated cleanup and closure process. If DOE decides what to do with the waste in the tanks first, then the tanks, and finally the soil under a tank, they may run the risk of the first step being the wrong alternative. Dirk agreed with Al and Mike, there are some tanks that need more treatment than other tanks, but the dirt could go back in an existing hole if it is treated.
- Pam asked if DOE-ORP needs to have HQ approval of the EIS. Mary Beth said they do. Pam said that if the EIS does not get to the current administration it could take additional years to get approval. Dirk did not think the change in administration would pose a big problem. He said either way, there will be extensive comment on the draft EIS.
- Jeff Luke said while closure is the ultimate goal, it is clear the EIS is a key part of that. If the EIS comes out and says DOE plans to do "x", but the majority of the Board wants "y" there will be difficulty. Jeff thought that closure is pretty far down the road, and the EIS is here now, so the committee and the Board needs to look at the EIS and provide clear input on it. Jeff said the committee may not be in agreement about how the end state should look, but it is the committee's responsibility to make sure all of the concepts are considered.
- Jeff Lyon encouraged the committee to focus on the parts of the EIS that will influence decision points across the site such as tank closure. Jeff said committee input on the decisions that are going to be made will help the agencies the most. Jeff said committee members may want to comment on the analysis and the models, but that is not necessarily the most helpful type of comment. Jeff said his team at Ecology thinks the DOE EIS team has done a good job. .

Cathy McCague listed some potential future topics for the committee to address related to the EIS and tank closure: new technologies and maximizing existing technologies, political ramifications in the decision making efforts, identify the real problems and their sequencing, and keeping an open mind to all alternatives. Wade said there is a permit that will be issued soon that needs to be tracked by the committee, after that the committee should think about sequencing activities around C Farm, and ultimately the committee should review the EIS.

Larry suggested that during the first quarter of 2009, Mary Beth could give the committee a synopsis of what the EIS includes. Mary Beth said she has committed previously to sitting down with stakeholders and focusing on specific areas they are interested in. Mary Beth said once she gets the EIS to HQ she will be able to schedule a meeting with the committee to discuss the document further.

### **Work Plan Review**

The committee reviewed their 2009 work plan. The committee decided to add spin tech, ion exchange, and cross flow filtration to the Fractional Crystallization topic on page one; Dirk and Ken Gasper were listed as issue managers. Steam reforming was also added as a new topic and the committee discussed the need for a near term presentation and an update on this technology being used at Idaho.

Mike reported that there is a new report on Secondary Waste Mass Balance and it shows that waste is above all limits for acceptance criteria for many constituents. Mike, who is the issue manager for this topic, will see if he can obtain a copy of this report so the committee can receive a presentation on it. Wade and Dirk were added as issue managers to the SST Integrity Panel topic and said a workshop is being developed currently for the end of October. The committee discussed having the NRC provide an update on their final report on WTP regulatory process at the next meeting via telephone. The S-102 topic was removed from the committee work plan. Finally, the committee discussed the need to schedule a presentation with the new contractor to discuss technology deployment and the arm-based retrieval technology that committee members have heard reports about.

Committee members provided additional edits to committee leadership for incorporation in the final 2009 work plan.

### **Discussion on Start up of Early Low Activity Waste (LAW)**

Dick Smith and Al Boldt put together a white paper as potential advice on this topic. Dick said he and Al are concerned that there are multiple paths happening for LAW, but they are not being done in parallel. The advice suggests that the multiple path approach be done in a way that will provide a timely treatment approach for LAW. Dick said taking any of the alternative approaches could bring the LAW facility online sooner than

DOE had planned. Early LAW would provide an opportunity to get more space in tanks, but would also show that the facility can actually make glass. Dick thought it is important to get something online in the near-term, and early LAW seems to be the only real option. Dick said he would like to put this advice on the table for committee discussion.

Ben Harp, DOE-ORP, said DOE-ORP has changed their path forward on doing early LAW and IPS since he last talked with the committee. Ben said they went back and looked at in-tank treatment, in-tank ion exchange, and micro filters. Ben said they have \$4 million funding for the technology development from EM for rotary micro filters and in-tank ion exchange. There is no money for IPS for this year in DOE-ORP's budget which has forced them to change their thinking on early LAW. Ben said they are considering when LAW would be available, but they want to avoid commissioning all of the facilities at the same time. DOE-ORP is looking to see if there will be enough feed for commissioning and are motivated to make glass. Ben said he could share the technology down select reports with the committee that will explain how this process works. Ben said DOE-ORP is also looking at whether they can take cesium out of the feed and mix it into the HLW feed. Ben said he would know more about the status of funding after the elections. Currently, they have a full design for ion exchange and spin tech is on its way.

### *Regulator Perspectives*

- Ed said Ecology has spent time talking about secondary waste issues and technetium. Ed said WTP will capture about half the technetium in the LAW and HLW glass, as a percentage of incoming feed. Most of the remainder is captured in the submerged bed scrubbers and recycled to the pretreatment facility. Ed said this process results in 95 – 99 percent ultimately captured in low activity glass and disposed onsite. Ed said if the LAW facility is run without being able to recycle to pretreatment, all of the cesium captured in the submerged bed scrubber will go to the secondary waste stream. Al suggested that you could send the solution back to tank farms to evaporate. Ed said that is an option being considered by DOE but the decision on design configuration of a new secondary waste facility or upgraded ETF have not been made yet. Ed recommended connecting the decisions between secondary waste and early LAW. Ed said Ecology is also concerned about the funding limitations and does not want to end up delaying WTP. There are also issues with early LAW operating at the same time construction is occurring at WTP creating a safety issue. Ed commented Ecology likes the idea of early LAW and being able to benefit from lessons learned at startup. Ecology participated with DOE and CH2M Hill in the down select workshop when the mission was a twenty year mission to build a stand alone facility. Ecology preferred Fractional Crystallization because it would free up more tank space, does not create a secondary waste problem and allows more retrieval.

### *Committee Discussion*

- Dick said if DOE could run the system without cesium removal, they would not need the in tank ion exchanger. Dick said the plant could run cesium concentrations higher

than design basis, but would result in hot spots around the plant and shielding would have been added.

- Pam said Jim Rispoli, DOE-EM, owes a response to Congress about supplemental treatment. Pam said it does not sound like there are any supplemental treatment options that DOE feels confident about and wondered where that leaves the program at. Ben said the report is at the Office of Management and Business (OMB). Ben said for supplemental treatment they are forced to examine funding priorities for the whole department, and there just is not funding. Pam asked if LAW started early, how much feed would not require pretreatment. Ben said none with the current shielding limits, but DOE-ORP is evaluating defining the rates and adding shielding to some areas.
- Dirk asked if anyone has looked at using FC to make a clean waste stream for LAW and to remove sodium from the waste. Ben said they examined that technology but it did not work. Dirk said FC has certain advantages: it has the opportunity to reduce the lifecycle mission of the whole process by removing the sodium and nitrates and could eliminate the need for supplemental treatment.
- Larry said the committee would be interested in hearing how decisions were made in the down select report. Ben said he talked with the committee about this report in August. Ben said DOE-ORP has shifted focus since the report came out and the parameters that led them to select the capital facility have changed. Ben said he would be happy to share the report, but warned that it will not reflect what ORP is doing currently.
- Al said if IPS has to go with a full schedule and there is no money for it this year, then it probably would not be ready until 2018 at which point it would be of limited use. Al said the advice is policy level on implementation of treatment. Al thought that there are options for doing things cheaply and this advice asks DOE to consider some of these options.
- Harold expressed concern with the advice's discussion section. He felt that the discussion was broken down to engineering level advice for how to implement a multiple path approach. Harold said he did not necessarily disagree, but felt this is not the function of the Board. Maynard said he agreed with Harold that the committee does not want to get outside of policy issues, but thought the committee could make other suggestions for DOE to consider.
- Dick said he felt that the decision making on these programs goes on behind closed doors and the Board does not find out until it is a done deal. Al said the committee was initially told there was funding for early pretreatment, and then that it would be a capital facility, and now that the facility is dead. Al said he and Dick thought maybe there is another way to do it.
- John Truax said the down select process showed that benefits to FC, but the information was based on a small pilot scale tests at Savannah River that did not use hot waste. John said to gain the maximum benefit for early LAW they would have to do additional testing which would push it out too far to be beneficial. Larry said what John said is true, but there are parallel studies that have been done where actual waste was used in a clean salt technology. The process is almost identical, the title was

changed, and it was successful. Larry said he thought that when the down select process happened, DOE chose ion exchange to move forward with, but also asked for FC to move forward if additional money was available. Ben said that was true and because of a lack of funding both technologies dropped off and the department is now looking at an in-tank system. The operations cost of a LAW facility from 2014-2019 would be a huge expense and would not buy much off the mission completion date.

- Maynard said too often decisions are made by looking at the money in the short-term and consideration should be given to the long range lifecycle costs.
- Mike said it seems like the advice advocates for early LAW to free up double shell tank (DST) space. Mike asked if this was the real issue. Dick said the DSTs are the show stopper in terms of retrieval. WTP will use the waste feed faster than DOE can retrieve it. If there was additional space in the DSTs, then additional waste could be retrieved to provide feed for WTP. Mike agreed the WTP has to run at 100 percent. Ben thought that there are opportunities to improve retrieval which could increase the feed. Dick commented if DOE found a way to improve retrieval, they would still need somewhere to put the extra waste since DSTs would be full under the current retrieval strategy.
- Pam said she was discouraged by what she heard today. The bottom line is that there is no capacity for retrieval and a concern about feeding WTP. Pam asked if options existed to be constructive in retrieval and to prepare for WTP. Pam thought “feeder tanks” (not storage tanks) might be a solution to get additional storage and to provide feed to WTP. Dick said it is still a matter of money; DOE would need to remove money from WTP to build any new tanks. Pam argued that the waste could be removed from the tanks sooner and would feed WTP adequately by using feeder tanks adjacent to WTP.
- Dick said there is a perception that it is essential to get the waste out of the SST, but he was not sure it is true. Mike said the tanks that have already been drained are the easy tanks. Mike thought that retrieval should be based on risk, and the focus should be on retrieving the high risk tanks and leave the DSTs.
- Larry asked if Ecology and DOE are on the same page for a path forward for the Hanford site. Ed said sometimes Ecology and DOE are on the same page, and sometimes they are not. He reiterated his recommendation of DOE looking at an integrated system addressing early LAW, WTP feed and secondary waste. He commented that the reason FC came in second was due to the design and build timeframe of a three story structure not that the technology was any further behind.
- Dick asked if DOE saw any value in the suggestions in the advice even though they are not policy issues. Ben said he did not have an issue with the advice. Ben said DOE is currently doing an alternatives analysis to condition the plant for early start up and could look at the alternatives in the advice as they do this.
- Dirk asked if there is an opportunity to use the existing evaporator instead of building a new facility for FC. Ben said the demand on current evaporator is too high and it would not be possible.

- Larry asked if the \$4 million for micro filtration and ion exchange is a carry over. Ben said part of it is, and part of it is new EM money.

The committee decided to get an update from Ben at the next meeting, and tentatively plans to issue advice at the December Board meeting. Larry asked Dick and Al to rework the advice n with Harold’s input. Dick asked for any other input from committee members before November.

**Action Items / Commitments**

1. ORP presentation on alternative analysis & supplemental treatment (review of draft advice)
2. NRC final report on WTP regulatory processes + appendices on technical issues
3. Secondary waste mass balance
4. ORP review of final report on secondary waste roadmap
5. ORP presentation on steam reforming used in Idaho
6. ORP presentation on evaporator upgrades
7. SST integrity panel issue manager update on workshop

**Handouts**

*NOTE: Copies of meeting handouts can be obtained through the Hanford Advisory Board Administrator at (509) 942-1906, or tholm@enviroissues.com*

- LAW Treatment Path Forward, Dick Smith and Al Boldt, October 1, 2008.
- Tank Waste Committee FY 2009 Work Planning Table (updated 9/30/08).
- Citizen’s Guide to Tank Closure Standards on the Hanford Site, Ecology, 10/7/08.
- WMA C Closure Planning, Ecology, October 2008.
- Closure Process and Decisions, Jeff Lyon, Ecology, October 2008.
- Pretreatment Engineering Platform – Reducing Technical Risks for the Waste Treatment Plant Pretreatment Facility through Scaled Process Testing, Rob Gilbert, DOE-ORP, October 7, 2008.
- Draft 1.0 Introduction Secondary Waste Roadmap, Billie Mauss, DOE-ORP, October 2008. What about the flow sheet? Level 1 – Overarching Secondary Waste Roadmap

**Attendees**

**HAB Members and Alternates**

Al Boldt	Susan Leckband	Dick Smith
Rob Davis	Sandra Lilligren	Bob Suyama
Dirk Dunning	Larry Lockrem	
Harold Heacock	Jeff Luke	
Mike Korenko	Maynard Plahuta	
Pam Larsen	Wade Riggsbee	



**Others**

Paula Call, DOE-RL	Robbie Biyani, Ecology	Cathy McCague, EnviroIssues
Mary Beth Burandt, DOE-ORP	Madeleine Brown, Ecology	Emily Neff, EnviroIssues
Lori Gamache, DOE-ORP	Ed Fredenburg, Ecology	Mark Triplett, PNNL
Rob Gilbert, DOE-ORP	Jeff Lyon, Ecology	Annette Cary, Tri City Herald
Ben Harp, DOE-ORP	Ginger Wireman, Ecology	Fred Beranck, WRPS
Bob Lober, DOE-ORP		Mike Berriachoa, WRPS
Billie Mauss, DOE-ORP		Susan Eberlein, WRPS
Deb Fine Richards, DOE-ORP		Felix Miera, WRPS
John Truax, DOE-ORP		Keith Quigley, WRPS