**FINAL MEETING SUMMARY**

**HANFORD ADVISORY BOARD**

**TANK WASTE COMMITTEE**

*March 11, 2015*

*Richland, WA*

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

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**Opening**

Dirk Dunning, Tank Waste Committee (TWC) chair, welcomed the committee and introductions were made. The committee adopted the February 2015 meeting summary with minor revisions.

Ryan Orth, EnviroIssues, noted that the Hanford Advisory Board’s (HAB or Board) River and Plateau Committee had met the previous day in a joint session with the Budgets and Contracts Committee (BCC). Ryan announced that the 2015 DOE public budget workshop would occur on April 28, 2015, and he reminded TWC members that BCC leadership requested HAB members attend the workshop and forward any thoughts or concerns on the FY 2017 budget onward. BCC plans to synthesize HAB feedback into advice on the FY 2017 Budget, tentatively scheduled for Board review at the June HAB meeting.
Cesium Treatment and Disposition Issue Manager Update

Issue Manager Update

David Berhard, issue manager for cesium treatment and disposition as it relates to the Low-Activity Waste Pretreatment System Facility (LAWPS), provided the committee with an update on ongoing issue manager work. David noted that LAWPS will allow some low-activity waste (LAW) from Hanford tanks to be treated before the overall Waste Treatment and Immobilization Plant (WTP) system begins operations, and LAWPS will free much-needed space in Hanford double-shell tanks (DST). David recognized that current plans call for cesium removed during LAWPS treatment to be returned to DSTs; however, the U.S. Department of Energy—Office of River Protection (DOE-ORP) has requested that the Board produce a report analyzing potential alternative pathways for LAWPS cesium disposal.

David continued by noting that the U.S. Department of Energy (DOE) has been studying deep boreholes as a potential strategy for cesium disposal in the coming years. Current plans for LAWPS call for a re-usable (elutable) cesium capture media to be used, but LAWPS may be altered to accommodate a non-elutable medium if borehole disposition becomes a feasible option. David recognized that issue managers were continuing conversations with DOE-ORP on the subject, and he stated that the potential for deep borehole disposal opens many policy questions that have yet to be explored.

Key issue manager updates on the topic include:

- If cesium were to be removed from tank waste supernatant, it would reduce the heat load in tanks; however, the benefit is small.

- Issue managers drafted a process chart* to demonstrate the cesium removal process, as they understood it. Issue managers noted that, following conversations with Steve Pfaff, DOE-ORP, parts of the diagram need to be updated. A summary of these changes include:
  - Taking away the technetium removal (Tc Removal) step
  - Noting that the retrieved cesium could potentially be disposed of in a deep borehole.
  - Bolding the currently planned pathway for cesium removal to better highlight potential disposal alternatives

- Conversations with DOE-ORP have recognized that LAWPS is ready for critical decision 1 (CD 1) in the coming months.

- The Board needs to approach the idea of risk differently as it relates to LAWPS and cesium removal. HAB advice generally looks at topics such as this, but the approach for this deliverable is different. In this case, the Board product needs to recognize potential risks and concerns and then identify what can be done about them.

*Attachment 1: Discussion Areas for the Waste Treatment and Immobilization Plant Communications Strategy (Draft v0)
**Regulator Perspectives**

Dan McDonald, Washington Department of Ecology (Ecology), stated that Ecology considers cesium to be high-level waste (HLW), and Dan noted that the current disposal pathway for HLW is vitrification and placement in a deep geological repository. To Ecology’s knowledge, DOE-ORP’s only chosen strategy for managing cesium present in low-activity waste (LAW) is the use of an elutable resin and the return of cesium to the DSTs. Ecology is currently taking the narrow perspective that vitrification is the best pathway to waste disposition. Dan reminded TWC that any disposition pathways that the committee may consider would need to be permitted by regulators, and the permitting process may take between 24-36 months.

**Committee Questions and Responses**

*Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.*

Q. Is there any sense of the volume of cesium that will be removed by LAWPS?

*There are 450-500 kilograms of radioactive cesium in the tanks. If approximately 13% of that is captured by LAWPS in the first 10 years of operation, this is around 58-65 kg of cesium. The cesium itself will not add up to any incredible amount, but sulfides and sulfates will add up in the off-gas.*

Q. What is meant by “CD-1”?

*The critical decision phases are as follows: CD-0 is the initial development of a plan that identifies need (CD-0 for LAWPS occurred in February 2015). CD-1 is the next step, expected in April 2015. CD-1 is the go-ahead. CD-2 is expected sometime in 2017, and this will require at least 90% design. CD-3 is expected in 2017 or 2018, and actual dollars are committed to a project. CD-4 is tentatively scheduled for 2021 or 2022, and that will begin hot operation of the facility. The General Accountability Office has done a review of LAWPS, and that is due to be released soon.*

Q. One risk that this product needs to recognize is the potential for LAWPS treatment slowing or shutting down.

Q. Will there be a separate effort moving forward that explores potential disposal pathways for the cesium currently stored at the Waste Encapsulation and Storage Facility (WESF)?

*Yes. It is the understanding of the issue managers that the disposition pathway for WESF cesium may be the same as cesium isolated at LAWPS. There are other problem elements (such as technetium) that may also be able to pull lessons-learned from this situation, as well.*

Q. From my understanding, some Hanford wastes cannot be vitrified. From Ecology’s perspective, how will DOE dispose of these wastes?

*Attachment 1: Transcribed Flipcharts*
R. [Ecology] As Ecology understands, there are approximately ten different formulations of glass that DOE-ORP has created in anticipation for various mixes of tank waste. Questions about glass formulation should be referred to Al Kruger, DOE-ORP. Ecology is unsure whether planned glass formulation accounts for sulfur and chlorine included in waste.

Q. With regards to the process chart created by issue managers: was this chart created with the assumption that all of the cesium within waste will be captured as waste travels through each of the pathways?

R. The process separates the DST waste into liquids and solids. Heavier materials are returned to the DSTs. Ten percent of the waste (liquid) flows through the ion exchange, and cesium is stripped out. The 10% flow that is not cesium then continues through LAWPS. The cesium will be returned to the tanks and await treatment at the HLW Facility.

R. [DOE-ORP] If the cesium were captured in the LAW stream, it would be sent to the Integrated Disposal Facility (IDF). However, the cesium needs to go to the HLW Facility for vitrification.

R. [Ecology] There is a difference between the filtration flow ratio (the 10% that has been referred to) and the capture ratio. Ecology has not yet seen the efficiency capture ratio for cesium in the ion-exchange columns.

Q. If cesium is captured and returned to tanks, will that not increase the heat load for DSTs?

R. [Ecology] DOE-ORP has noted that this process would not add much heat and that the agency has planned strategies for minimizing negative impacts.

R. [DOE-ORP] The DST ventilation systems are designed to handle this.

Q. DOE headquarters seems to be very excited about the possibility of deep borehole disposal. What would the permitting process for shipping look like?

R. [Ecology] A permit would be required to move cesium from wet storage in WESF to dry storage. No plans, designs, or white papers for this movement have yet been produced for review. Movement of cesium and strontium capsules currently stored at WESF would also require new facilities and new waste categorization, and any permitting process would need to take this into account.

Q. Has DOE-ORP looked into precipitating cesium using ferrocyanide? This strategy was used to create the capsules stored at WESF. What is the ratio of capture for this process? Is it feasible to explore this strategy for future capture?

R. [DOE-ORP] LAWPS considered in-tank cesium capture; however, the risk associated with that strategy drove DOE-ORP to consider a facility capture of cesium.

C. DOE-ORP has noted in conversations with issue managers that the cesium waste stream will aim to be flexible enough that it could accommodate alternative cesium disposition pathways if they were to be discovered.
Q. Does the cesium in tanks have any use in medicine?

R. Cesium was extracted in the past, largely for food irradiation. It is currently unknown if there is a medical market for the cesium isotopes. The report should explore this potential use further.

Issue managers agreed to review and update the process flow chart, and they requested that TWC members forward any ideas, questions, or concerns via email. Issue managers will continue to discuss the topic and coordinate with DOE-ORP as needed in the coming month, and the committee agreed to revisit the topic in April 2015 and receive an additional issue manager update.

**Waste Treatment Plant Issue Manager Update**

**Issue Manager Update**

Bob Suyama, issue manager for the WTP Communication Plan, provided the committee with an update on ongoing issue manager work. Bob provided the committee with a handout* noting areas for discussion and clarification that he had identified, and he requested that TWC consider the list of discussion areas and note any questions for addition. Bob noted that a holistic list of questions could then be forwarded to DOE-ORP for discussion and clarification of WTP Communication Plan form and purpose.

**Agency Response**

Joni Grindstaff, DOE-ORP, thanked issue managers for the comprehensive list of questions. She noted that the list was an excellent starting point for the creation of the Communication Plan, as DOE-ORP was hopeful that the WTP Communication Plan would be composed of the Board’s thoughts and recommendations within the identified discussion areas. Joni recognized that HAB members are representative of many stakeholder groups, and DOE-ORP believed that an effective WTP Communication Plan would be representative of this diversity. Joni encouraged issue managers to revisit the list of discussion areas, provide answers to outstanding questions, and continue coordinating with DOE-ORP to compile those answers into a draft Communication Plan.

**Regulator Perspective**

Dan McDonald, Ecology, offered that Ecology supports enhanced communication surrounding the WTP, and he noted that Ecology would be glad to assist the HAB in its creation.

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* Attachment 3: Low Activity Waste Flow Chart (with Alternate Pathways for Consideration)
Committee Questions and Responses*

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

C. At a past EM SSAB meeting, the Department of Communication at the Portsmouth/Paducah Project Site shared outreach strategies for communicating long-term stewardship at the site. The office has spent millions of dollars and many years crafting this plan. Their in-depth research efforts identified messages and communication needs by audience, and that work demonstrated that identifying audience needs is the most important aspect of effective communication.

C. This topic is very encouraging, and it represents a paradigm shift for WTP communication efforts. Local media interests have expressed frustration with DOE in recent months, as they have been unable to garner much information from the agency. The Communication Plan is a good strategy to have in place in preparation for the release of the U.S. Department of Justice (DOJ) gag order. DOE should follow up with DOJ and provide the Board with a tentative timeline for the release of the gag order.

C. Hanford Communities has a speaker series, and the organization has recently been working with Ecology. Presentations are scheduled all over Washington at schools and civic organizations. Venues such as this would be good for DOE and Bechtel National, Inc. (BNI) to explore once DOJ releases the gag order.

C. The Seattle press perpetuates a highly negative view of the WTP process, and it is a difficult message to counteract. The Communication Plan should take this into account.

C. The Public Involvement and Communication Committee (PIC) would enjoy the opportunity to weigh in on this plan, as well. The committee is planning to discuss this effort at their April committee meeting; this may be an opportunity for PIC and TWC to work together to respond to some identified questions.

Bob thanked the committee and DOE-ORP for the additional clarification and discussion on the WTP Communication Plan. Bob noted that issue managers would meet with the PIC committee in April to discuss outstanding questions and strategies for the Communication Plan, and Steve Hudson stated that he would forward issue managers the Communication Strategy commissioned by the Portsmouth/Paducah Project Office. In the coming month, issue managers will continue WTP Communication Plan discussions and coordinate with DOE-ORP as needed. The committee agreed to revisit the topic in April 2015 and receive an additional issue manager update.

One System

Introduction

Dirk noted that the TWC had heard reference to the DOE One System program during the previous month’s update on WTP progress. Ecology and DOE-ORP had encouraged the Board to learn more about

* Attachment 1: Transcribed Flipcharts
the program to further inform the HAB’s understanding of ongoing integration efforts at the WTP and the tank farms.

Agency Presentation

Briant Charboneau, DOE-ORP, noted that the One System program had been presented to the Board in the past, but he recognized that the program has recently gone through a revolution. Briant stated that the One System program is a strategic reemphasis on a project management approach to drive the start of the Direct-Feed Low Activity Waste (DFLAW) Facility and the overall DOE-ORP Mission. The near-term goal of the One System program is getting the DFLAW Facility initiated within the upcoming ten years.

Key messages from Briant’s presentation* included:

- The One System approach provides an integration check for tank farms and the WTP. The responsibilities of the program are crosscutting, and the program’s purpose is to ensure that, once all pieces are assembled, everything works together as it should.

- The DFLAW Facility is scheduled to begin processing by 2022. The DOE-ORP internal date is a bit earlier than the 2022 deadline to ensure that the facility starts up as planned. The DFLAW Facility will work to treat the mobile, highest-threat constituents of LAW. DOE-ORP will use a phased approach to begin treating LAW; the first part is to process the supernatant.

- Initially, the One System approach was implemented in 2011 through contract language that directed contractors to integrate their activities and efforts. The organization has since evolved into one that spans contractors and both DOE field offices, and the implemented program management tools are very similar to project management tools.

- For DFLAW start-up, One System has created an integrated schedule that takes a high-level view of the pieces that each organization needs to contribute to get the facility started on time. This integrated schedule is approximately sixteen pages long, and the One System program looks at each activity to see where the critical path to start-up lies. The One System team then informs management and contractors of their contributions to the overall project.

- Funding for DFLAW is not fully procured, but there are enough funds available for work on the facility to commence. The DFLAW Facility avoids most of the common risks that waste treatment involves, such as erosion, corrosion, and HLW.

- The flow sheet is not perfect. The length of the DOE-ORP mission is long, and the financial cost is very large. Even secondary waste streams can be very expensive to manage. One System looks for strategies to improve efficiency.

- One System is directly responsible for integrating activities and reporting the overall status of a project to management.

*Attachment 4: One System: Managing the Office of River Protection Mission and Delivering Direct-Feed Low Activity Waste (DOE-ORP presentation)
For general work, the One System Program has set up a hierarchy of management. The Executive Council consists of six individuals—three DOE-ORP assistant managers, the DOE-ORP One System Division Director, and the Washington River Protection Solutions and Bechtel One System Managers—who meet once every two weeks. If any issue is identified by the Executive Council, it is elevated to the One System Governance Board.

Mike Hughes, BNI, and Leo Thompson, WRPS, contributed additional information about the One System tools. Key presented messages include:

- The DFLAW flow sheet is very close to the point where it is technically solidified. There may be opportunities to improve it moving forward, but the process should be sound. One of the first actions that the One System program undertook was to create a flow sheet that demonstrated each organization involved in DFLAW and listed their contributions, inputs, and outputs. The flow sheet detailed all facilities needed to support waste and products, as well as noting infrastructure needs such as power, water, etc. This process also looked at the contractual, funding, and regulatory mechanisms needed to support all efforts. This tally recognized that there are 59 critical decisions that need to be made in order for this project to work. For the DFLAW Facility to start up on time, each of those critical decisions needs to be planned and managed effectively.

- The fully integrated flow schedule looks at the DFLAW program from the bottom-up and attempts to identify components that may potentially cause future scheduling concerns.

- The permitting schedule for DFLAW is complex, and 32 separate permits are needed to allow the facility to begin treatment. Permits are a mixture of existing and new permits with either Ecology or the Washington Department of Health (WDOH). DOE-ORP has been working with regulators to ensure that all permitting activities are managed effectively. The key to success is involving regulators in the process as early as possible.

- Another functional piece of the One System team’s work is to ensure that workers are trained to effectively run the WTP system whenever it comes online.

Regulator Perspective

Dan McDonald, Ecology, noted that it is encouraging to see the One System program work to build effective working relationships early in the process. Dan recognized that success for complex projects such as the DFLAW Facility hinges upon communication. Dan noted that Ecology would like to ensure that the start-up process is smooth. Dan noted that the One System organization is a staff organization, as opposed to a direct line authority organization; therefore, the One System team accomplishes tasks in conference with the line of authority organization. Dan encouraged the TWC to keep this in mind as they considered the work of the One System program. In closing, Dan noted that he appreciated the lifecycle-approach that the One System team is taking to WTP operations, stating that the WTP is about maintaining and managing the product as well as ensuring a successful startup.
Committee Questions and Responses*

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

C. The road to success is coupled with a collective understanding between DOE, contractors, and the public. It is important that the information presented today continue to make its way into the Hanford community. It is important for the Board to continue to track the One System Program and communicate it when possible.

C. The One System presentation appeared to demonstrate an integrated baseline. This is important for purposes of ensuring future funding.

Q. The presented integrated flowsheet is very complex. Is there fear that the flowsheet is too complex? Has the One System team found any opportunities for improving efficiencies?

R. [WRPS] On the DFLAW flowsheet, the One System team has been carrying out rapid improvement events and analyzing strategies for improving upcoming processes.

R. [DOE-ORP] The One System team is continually mining data, searching for operations that can be improved. The team looks at operations on site and continually aims to streamline procedures and ensure that efforts are not duplicated.

Q. What do One System coordination meetings look like? Are the meetings done in-person? Via email?

R. [DOE-ORP] The One System team meets in person, for the most part. Very few email chains are exchanged. There are daily coordination meetings between many of the team members, and there are rapid improvement events that team members engage in regularly.

Q. The Effluent Management Facility (EMF) and the Effluent Treatment Facilities (ETF) did not seem to be included in the presentation flowsheets. Why were they omitted?

R. [DOE-ORP] The ETF scope is within the DOE-ORP contract. It was not included on p. 14 of the presentation because it is not considered a new start.

R. [DOE-ORP] The EMF is on the flow sheet—that is one of the major areas that the team has been working on. One of our major tools that is not yet ready for distribution takes all of the primary and the secondary waste coming out of the ETF. One System would like to trace every waste element coming out of the plant. The EMF is included in the DFLAW initiative. Within the EMF complex, there will be evaporators. The evaporated waste will then travel to the ETF. The transition is underway to move the ETF to the WRPS contact under DOE-ORP.

C. It is encouraging to see that two items on the 2015 HAB Work Plan relate to the DFLAW Facility—it demonstrates the DOE is carefully considering all of the necessary pieces to ensure a successful start-up.

* Attachment 1: Transcribed Flipcharts
The messages presented by the One System team are important to convey through the WTP Communication Plan.

The committee agreed to revisit the topic whenever the One System team felt that they had updates to share. TWC members believed that the next One System update could potentially be presented to the full Board, and committee members encouraged the One System team to share their work with local media interests and the public.

**Tank Vapor Implementation Plan (joint w/ HSEP)**

*Agency Presentation*

Tom Fletcher, DOE-ORP, provided the committee with a presentation* illuminating planned follow-up to the 2014 Tank Vapor Assessment Team (TVAT) report. In his presentation, Tom noted the following key ideas:

- Both DOE-ORP and WRPS are committed to further improving worker protection. Since the events that occurred in the March 2014 timeframe, WRPS and DOE-ORP have taken a multifaceted approach to protecting workers through increased controls and through enlisting the support and expertise of the TVAT.

- The TVAT report, released in October 2014, arrived at four major conclusions:
  - There is a risk of bolus (acute) vapor exposure
  - There is a need for enhanced exposure measurements
  - There is an industrial hygiene parity with radiological controls
  - There is a need for ongoing leadership commitment to address vapor exposures

- The TVAT review was conducted over six assessment areas, and the report issued 10 overarching conclusions and 47 individual recommendations. WRPS and DOE-ORP will address thirty of the recommendations in Phase 1 of the implementation plan, while implementation of the remaining recommendations will be ongoing.

- The WRPS implementation plan was released on February 10, 2015 to address the implementation of the TVAT recommendations. The implementation plan outlines a multiyear effort to reduce the potential for chemical vapor exposure across the board, and the plan will follow a phased release schedule.

* Attachment 5: Tank Vapor Assessment Team (TVAT) Follow-Up (DOE-ORP/WRPS presentation)
DOE-ORP will manage an expert panel to serve as a technical resource for the implementation plan. The panel will be managed by Keith Klein. The panel will also monitor progress and support transparent communication efforts.

Phase 1 (near-term actions, 2015-2016) of the implementation plan has three components: (1) people, (2) equipment, and (3) data analysis.

- Current tank vapor management efforts are dependent upon personal protective equipment (PPE) and administrative controls. Desired future management efforts will be more dependent upon source vapor removal and engineered controls. DOE-ORP and WRPS are also looking into tank farm updates that will allow for more effective monitoring of bolus events.
- Sampling and characterization of tank head space vapors will occur in the coming years. Findings will serve to effectively guide Phase 2 implementation strategies.

Phase 2 (long-term actions, 2017-2019) of the implementation plan focuses on the institutionalization of hazard reduction. Phase 1 will inform specific work protection measures implemented in Phase 2.

PPE is an effective tool for preventing worker exposure, but it often presents hazards in and of itself. Balancing those hazards is vital for safe tank farm operation.

The tank farms need to be updated for the 21st century. As WTP activities begin, transfers will increase significantly. Wireless infrastructure and centralized control rooms will allow for greater management flexibility.

Through worker engagement and communication, DOE-ORP and WRPS are committed to transparency. Workers will be briefed, and management will work to identify aspects of tank farms that are not functioning safely or efficiently. There are three levels of safety checks that are currently operating. Technical Regulatory Support (TRS) has overall regulatory oversight.

Worker safety is of the utmost importance moving forward.

**Regulator Perspectives**

John Martell, WDOH, stated that he has been heading a group convened by Washington Governor Jay Inslee to oversee the issue of Hanford tank farm vapors. John stated that WDOH is most interested in seeing workers effectively protected, and there are several members of the team currently reviewing the WRPS implementation plan. He noted that official comments from reviewers are due back soon, but his general sense is that the implementation plan is heading in the right direction, despite the implementation plan not including an exceptional amount of detail.
Committee Questions and Responses*

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Are you considering risk to tank farm workers from now until WTP start up? Operations at the tank farms will change significantly as the WTP complex evolves.

R. [DOE-ORP] Yes, the implementation plan looks ahead to WTP operations. The worker protection infrastructure at the tank farms needs to be able to adapt to changing needs. The tank farms will need to be looked into systematically. Over the past 3-4 years, there has been a significant level of integration at the tank farms. Future operations need to be protective of workers, human health, and the environment.

Q. Is the TRS standing?

R. [DOE-ORP] TRS is standing, and it provides oversight to both of DOE-ORP’s major projects (tank farms and WTP) and reports directly to Kevin Smith. The DOE expert panel is an entirely new organization.

Q. What are the near-term stumbling blocks that DOE-ORP and WRPS will be focusing on overcoming?

R. [DOE-ORP] The report hypothesized the existence of a bolus exposure. It is important to implement technology that can identify these bolus releases; until DOE-ORP and WRPS understand what is happening at the tank farms, it is difficult to control for it. That is currently the biggest obstacle.

Q. Putting workers in a self-contained breathing apparatus (SCBA) is a difficult thing to do. The air is very dry, the equipment is very heavy, the unit blocks vision, and there are icing hazards in cold weather. Have DOE-ORP and WRPS looked into strategies for getting workers off of SCBA?

R. [WRPS] The ideal would be to look into headspace gases and implement cartridges on a farm-by-farm basis. WRPS is currently looking into five tank farms. This is Phase 1—DOE-ORP and WRPS are looking at detection and monitoring. Our efforts will look into (1) the conditions that could potentially cause a bolus exposure and (2) how WRPS can track bolus releases in the future. Some potential technologies could destroy the vapors at the source. In some cases, PPE and SCBA may be the most appropriate course of action. The implementation plan Phase 1 strategies amount to identifying a tailored approach to tank farm entry that is mindful of worker protection and works to balance risks between tank farm vapors and bulky, onerous protective equipment.

Q. From a health and safety perspective, recent HAB advice incorporated ambiguity as to which compounds workers were exposed to. It can be inferred from sampling that there is no continuous flow of vapor being released; therefore, the exposure must come from a bolus event.

* Attachment 1: Transcribed Flipcharts
R. [WRPS] There has not yet been evidence found of one chemical that could be responsible for the worker exposures.

R. [DOE-ORP] Enhanced headspace sampling will give WRPS and DOE-ORP a better idea of the chemical vapors that are present within tanks. Samples will be run through a Mass Spectrometer, which will be able to identify the individual compounds present.

R. [DOE-ORP] Concerning vapor release, there was a group that focused study efforts on local meteorological data collection. The goal of their efforts is to integrate a camera system and near-term monitoring with localized weather conditions. The goal of this study was to allow detection efforts to be predictive.

Q. TWC has recently been discussing the DFLAW Facility. When this facility begins operation, it will be pumping waste both to and from the tank farms. Could there be the potential for release all along the pumping infrastructure?

R. [DOE-ORP] Yes. The major concern is the ventilation system. There will be two permitted ventilation systems in this process—one at the LAWPS and one at the LAW Facility. There is also the potential for vapor release at the tank farms as waste is returned.

Q. The Board recently released advice to DOE-ORP. It noted that there is potentially a long-term health risk to workers stemming from vapor exposure. What is DOE-ORP’s response to this item?

R. [DOE-ORP] The advice is currently in the review process. Workers are having symptoms, but there is no guaranteed connection to any chemical or event. DOE-ORP is interested in gathering additional information to better inform future mitigation efforts.

R. Many workers are concerned about the potential for long-term effects. Members of the Board encourage agility on this issue, as those individuals who were affected by vapor exposure at the tank farms need assistance and information.

Q. Do both WRPS and DOE-ORP agree that there have been worker exposures and health effects?

R. [DOE-ORP] DOE-ORP believes that there have been worker exposure with resulting symptoms, and the agency assumes that this is a true connection. However, this connection has not yet been verified with any data.

Q. Are data the determining factor? Are there any additional ways of looking at worker exposure aside from taking additional samples?

R. [DOE-ORP] It is difficult to offer effective protection if the mechanism is unknown. Even activated charcoal scrubbers will not remove everything. The long-term key to protecting workers is to determine connections and develop an enhanced understanding of exposures and symptoms.

Q. Are there plans to re-open cases for workers who have been denied compensation for vapor exposure?

R. [DOE-ORP] DOE-ORP representatives present today cannot speak to that issue at this time.
Q. Are all tanks designed the same way? Are there consistent numbers of ports on them, for example?

*R. [DOE-ORP] Tanks are not all the same. On average, there are 10-15 ports on single-shell tanks and 15-25 ports on DSTs. No ports are open; they all lead to particulate filtration. However, no ports go through any kind of chemical filtration.*

Q. What would the cost be to chemically filter each of these ports?

*R. [DOE-ORP] Most of the ports are sealed. Most tanks have 2-4 passive filters that breathe with changes in barometric pressure. This could potentially be the mechanism for bolus releases—Phase 1 and Phase 2 of the implementation plan should allow us to better understand release events and then effectively mitigate for them.*

Q. It seems likely that a definitive qualification of a bolus event may not be possible because of the age, number, and complexity of Hanford tanks. At some point, DOE-ORP and WRPS may need to recognize that the safest option for tank farm workers is PPE. What is the prize that empirically discovering a bolus event will yield?

*R. [DOE-ORP] The prize is worker protection. Data will allow DOE-ORP and WRPS to reach that point. Effective protection will also allow workers to perform tasks more effectively and more efficiently.*

Q. Members of the Board have heard that, due to the awkwardness of the SCBA equipment that workers are currently using to enter tank farms, productivity has decreased significantly—potentially to the extent of a 66% decrease. There needs to be recognition that work cannot be accomplished as efficiently as possible. Is the state recognizing this and creating strategies for accounting for resulting delays?

*R. [DOE-ORP] There has been a significant loss in productivity due to SCBA on high- and medium-risk workers (a loss of approximately 70% efficiency).*

Q. DOE-ORP and WRPS should not get caught up in identifying the cause definitively before working to mitigate for vapor exposure. If we know that problems are coming from vapors, that knowledge in and of itself can go a long way toward controlling the problem. There are certain operations that can be incorporated—catalytic, thermal, or oxidative destruction—that can help DOE-ORP and WRPS meet their goal of worker protection. It is very possible that the chemical behind recent exposures is an unknown, and sampling may be unable to identify it.

*R. [DOE-ORP] Ideally, mitigation strategies could target specific bad actors to completely eliminate their hazard. Knowing the cause is important in this regard.*

Q. Have any workers or medical personnel reported any exposure outside of the tank farms?

*R. [DOE-ORP] Yes. There was an incident where workers in a trailer outside of the tank farm noted an odor. This incident shut down the tank farm; all noted events are considered to be real events.*
Q. If we can do scientific tests on Mars, it is difficult to believe that the Hanford tank farms can not be managed remotely.

   R. [DOE-ORP] This point leads directly into the earlier comments noting that DOE-ORP and WRPS are working to construct the tank farms of the future. Tank farm management and operations need to go through a paradigm shift.

   R. [WRPS] Remote maintenance is understandable; however, there is no way to do retrievals without workers in the tank farms. In many cases, there is a lot of uncertainty that needs to be actively managed while retrievals are ongoing.

C. DOE-ORP should put out a challenge to industry to see if there are any emerging strategies or technology that tank farm workers could incorporate.

   R. [DOE-ORP] That call went out, and there was a technology exchange that incorporated representatives from fire departments, PPE manufacturers, abatement, national labs, universities, etc. Over 100 distinct groups attended.

Tom thanked the committee and noted that the TWC should plan to follow up on the Tank Vapor Implementation Plan progress during the next quarter (approximately August 2015). Tom noted that DOE-ORP would be willing to come back with an additional informational briefing.

**Committee Business**

**Committee Leadership Selection**

TWC reviewed the nominees for 2015-2016 leadership and confirmed Bob Suyama and Melanie Meyers for the roles of committee chair and vice chair, respectively.

**TWC 3-Month Work Plan**

The committee requested a full-day meeting in April that will tentatively include the following topics:

- Receive a briefing on C-Farm swim lanes (DOE-ORP presentation)
- Receive an update on WTP Communication Plan efforts (following a joint discussion with PIC during the week of the April Board meeting)
- Receive an issue manager update on cesium removal
- Receive a briefing on the PHOENIX program (DOE-ORP presentation, tentative)
- Brainstorm topics and prepare for the 2015 HAB Leadership Workshop

* Attachment 1: Transcribed Flipcharts
* Attachment 6: TWC 3-Month Work Plan
Attachments

Attachment 1: Discussion Areas for the Waste Treatment and Immobilization Plant Communications Strategy (Draft v0)

Attachment 2: Transcribed Flipcharts

Attachment 3: Low Activity Waste Flow Chart (with Alternate Pathways for Consideration)

Attachment 4: One System: Managing the Office of River Protection Mission and Delivering Direct-Feed Low Activity Waste (DOE-ORP presentation)

Attachment 5: Tank Vapor Assessment Team (TVAT) Follow-Up (DOE-ORP/WRPS presentation)

Attachment 6: TWC 3-Month Work Plan
### Attendees

Board members and alternates:

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<thead>
<tr>
<th>Name</th>
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<tr>
<td>David Bernhard</td>
<td>John Howieson</td>
<td>Melanie Myers</td>
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<td>Richard Bloom</td>
<td>Steve Hudson</td>
<td>Maynard Plahuta</td>
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<td>Shelley Cimon</td>
<td>Mike Korenko</td>
<td>Mimi Seppalainen (phone)</td>
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<tr>
<td>Dirk Dunning</td>
<td>Pam Larsen</td>
<td>Bob Suyama</td>
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<td>Becky Holland (phone)</td>
<td>Liz Mattson (phone)</td>
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Others:

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<td>Briant Charboneau, DOE-ORP</td>
<td>Jim Alzheimer, Ecology</td>
<td>Alex Nazarali, CTUIR</td>
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<td>Tom Fletcher, DOE-ORP</td>
<td>Dieter Bohrmann, Ecology</td>
<td>Mike Hughes, BNI</td>
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<td>Joni Grindstaff, DOE-ORP</td>
<td>Heather John, Ecology</td>
<td>Todd Nelson, BNI</td>
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<td>Jim Lynch, DOE-ORP</td>
<td>Dan McDonald, Ecology</td>
<td>Ryan Orth, EnviroIssues</td>
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<td>John Martell, WDOH</td>
<td>Brett Watson, EnviroIssues</td>
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<td>Tom Rodgers, WDOH</td>
<td>Emily Bays, Hanford Challenge (phone)</td>
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<td>Morgan Ashley, KNDU</td>
<td>Keith Klein, Longenecker &amp; Associates</td>
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<td>Michelle Searls, North Wind/DOE-ORP</td>
<td>Sharon Braswell, North Wind/DOE-ORP</td>
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<td>Don Bouchey, Public</td>
<td>Annette Cary, Tri-City Herald</td>
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<td>John Britton, WRPS</td>
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<td>Jerry Holloway, WRPS</td>
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<td>Mark Lindholm, WRPS</td>
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<td>Leo Thompson, WRPS</td>
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