



MEETING SUMMARY

HANFORD ADVISORY BOARD

TANK WASTE COMMITTEE (TWC)

DATE: *October 15, 2019* | **TIME:** *9:00 a.m. to 4:15 p.m.*

Richland, WA

Event Location: Richland Public Library

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The following meeting summary represents topics and presentations covered during the Hanford Advisory Board Tank Waste Committee (TWC) on October 15, 2019 from 9:00 a.m. to 4:15 p.m. in Richland, WA. This event took place at the Richland Public Library. This is only a summary of issues and actions discussed at this meeting. The following represents a summary of the topics corresponding with the meeting agenda and may not represent the fullness of represented ideas or opinions, and should not be used as a substitute for actual public involvement or public comment on any particular topic unless specifically identified as such.

Opening

Bob Suyama, Tank Waste Committee (TWC) Chair, welcomed committee members. Introductions were made of committee members and other participants (including online participants).

Previous Month(s) Meeting Minutes

The May 2019 meeting minutes were not approved because they are still under review by the DOE.

Announcements

Bob Suyama, TWC Chair made an open call for announcements and updates. He announced we have a very full agenda and will have to keep on schedule.

Bob reviewed the upcoming schedule of activities and meetings with the members.

Waste Management Area C

Bob Suyama introduced the topic of the Waste Management Area C. Dib Goswami, Project Manager for the Washington State Department of Ecology (Ecology), and Jeff Lyon, Project Manager for Ecology, provided members with an update on Waste Management Area C.

Agency Presentation

Key points from the Ecology presentation¹:

- Vadose zone modeling in the tank farms are necessary to estimate the nature and extent of contamination for C Farm and to assess the potential impact in the groundwater below.
- Based on the multiple lines of evidence and data, Ecology plans on a corrective action in the soil to stop further migration of contaminants from the vadose zone and in the groundwater, ultimately resulting in plans to close C Farm.
- Ecology used the small-scale heterogeneity and data on various hydrogeological parameters creating a 2-D approach.

Rod Lobos, Project Manager for the U.S. Department of Energy Richland Operations Office (DOE-RL), and Dib Goswami, Ecology, provided members with an update on Waste Management Area C.

Key points from their presentation²:

- The 2-D model extends from the southwest to the northeast using Subsurface Transport Over Multiple Phases (STOMP) software.
- The Fine-Grained Units (FGU) identified by the Nez Perce Tribe within the C Farm Performance Assessment represents the heterogeneity.
- The presentation slides illustrated the peaks in moisture content with FGUs and identified 15 FGUs distributed vertically with variable lateral extent. The elevation of the FGUs were displayed at various wells.
- The results cannot be directly compared to the 3-D model because in the 2-D model, the contaminants can only spread in two directions (vertical and along the cross section).

¹ C Tank Farm Heterogeneity – An Alternative Model

² Evaluation of Vadose Zone Heterogeneities Under Waste Management Area C

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- The STOMP 2-D Model Domain and Boundary Conditions included the source volume, inventory, and release period of 20,500 gallons and 10 Ci technetium-99 released in a 5-year period. The top part of the model indicated that they have to recharge the middle boundary which is familiar to what they have used inside the tank farm. Outside the tank farm, they have used a slightly lower recharge rate.
- The primary case used site-wide average hydraulic properties for Hanford Sandy Silt (HSS), showed the plumes migrating and spreading from the source between the tanks.
- Additional cases were conducted looking at the effects of eliminating water volume in conjunction with source release, removing impermeable tank structures from the field of flow, and the effects of modified hydraulic properties in the FGUs. The results included:
 - There was no significant effect when removing water.
 - If removing the tanks, the edges of the plumes get drawn towards the tanks because it's a drier regime.
 - There were three effects of hydraulic properties of the FGUs: equivalent homogeneous media, low permeable FGU, and high permeable FGU.
- The results from the alternative models with heterogeneities indicated only an incremental increase in lateral plume spreading within the vadose zone as the plumes migrate to the groundwater.
- The centers of mass generally remain below the source release and continue to migrate vertically downward to the underlying groundwater.
- The spreading of contaminant plumes in the vadose zone leads to a decrease in predicted contaminant concentrations and later arrival of peak concentrations in groundwater.

Committee Member Questions (Q), Responses (R), and Comments (C):

Note: This section reflects individual questions, comments, and agency responses.

Q: "What does this evaluation inform? How does it apply?"

R: "It shows that the understanding is good enough to make decisions."

Q: "You're running a base case and other cases. Are you modeling the uptake of the soil?"

R: "We model a bunch of different contamination models and look at the effects for things that are being absorbed."

Q: "Since this is a model, what are your plans to have an independent expert evaluate and cross-compare it?"

R: "This research has not been done in a vacuum. We are getting an NRC [Nuclear Regulatory Commission] review."

Q: "Could you give us an example of a hydraulic property?"

R: "It's the ability for the sediments to transmit water, in other words, how fast water flows through sediments."

Lateral Flow White Paper

Vince Panesko, City of Richland, gave a presentation on his Lateral Flow White Paper. Key points from his presentation³:

- The ancient lakebeds are impenetrable due to the pressure on them that has evolved over time. This would explain the location of the leaked waste under the tanks that have remained a mystery until now.
- The main focus is on contamination in the tanks, and yet there likely is more contamination outside of the tanks in the vadose zone.
- There are 400 million gallons of water being pumped from the Columbia River each year and distributed to the 200Area raising the question of what will happen in the future?

Agency Perspective

Ecology

Jeff Lyon took issue with Vince's suggestion a cumulative effects analysis has not been done. Over \$80 million has been spent on a past model, and we have started work on a new model that includes updated information from the past 10 years.

DOE

Doug Hildebrandt, DOE, augmented Jeff Lyon's comments by noting that an analysis was done in both 1998 and 2001. Jim Lynch, DOE, reminded the committee that there was a presentation on the CIE at the last HAB meeting and that DOE wants to continue conversations about that work with the River and Plateau (RAP) Committee in the future.

Response to White Paper Issues

Jeff Burreight, Oregon Office of Energy (ODOE), asked members to take a moment to review the ODOE Response to White Paper Issues. Jeff summarized the ODOE response. Key points from his presentation⁴:

- Moisture data shows there are layers of wet vs. dry.
- The largest uncertainty is where there is a cap on tank farm, and there is undiscovered waste underneath. If rain gets underneath that, it can spread the undiscovered waste and make it into moving waste.

Committee Member Questions (Q), Responses (R), and Comments (C):

Note: This section reflects individual questions, comments, and agency responses.

Q: "What is the status on C Farm now? Are we being pressured to take a position right away or are we waiting to do this report?"

R: "DOE is developing its response to the NRC request for additional information. It will be transmitted to the NRC in a week or so. Currently, there is a scheduled public meeting on October 29 about it."

Q: "Why doesn't lateral flow show up in the models? Why does everything go straight down?"

³ ODOE Lateral Flow Perspective WMA-C

⁴ Jeff Response

R: “In the original 1998 analysis, the model was like a pipe with layers in it so it only offered the option to go straight down. The CIE is correcting this for the Plateau, and we will be looking at volume discharge.”

System Plan 9 Alternatives

Bob Suyama introduced Kaylin Burnett, Project Manager for DOE-RL, and Dan McDonald, Project Manager for Ecology. No formal presentations with PowerPoint slides were made.

Kaylin Burnett gave an update on System Plan 9 Alternatives. He explained how Plan 9 builds on Plan 8 noting there are no dramatic changes except for the evaporator. Treatment dates are still being determined based upon the model.

Dan McDonald explained that Ecology has looked at and considered related HAB advice on this issue. Dan explained they believe they have characterized the scenarios, and the negotiations will be called “holistic negotiations”.

Committee Member Questions (Q), Responses (R), and Comments (C):

Note: This section reflects individual questions, comments, and agency responses.

Q: “Nine gives us worse news than eight. How prepared are you for good news, and what if Kruger is right and melters can do more than predicted?”

R: “There are TPA [Tri-Party Agreement] rules and regulatory drivers that drive up the cost of configuration change.”

Q: “What will you do next?”

R: “We will run and submit a report in about one year from now. Then you’ll have results.”

C: “HLW [High-Level Waste] will not be used here at this time. That’s what worries me.”

Q: “How does this play into the budget process?”

R: “The System Plan 8 is substantially different than those used in the past. It did have some influence on the budget, but in prior years, it has been separate. The budget cycles are in the March time frame for submitting. They will compare in the 3-year cycle, and if there’s a substantial difference, they will reevaluate.”

Grout

Bob Suyama introduced the topic of Grout.

Brian Harkins, DOE Deputy Assistant Manager for Tank Farms, explained that vitrification is the most expensive path one can imagine. The cleanup mission at Hanford is predicted to take 77 more years approaching a cost of a half-trillion dollars. An alternative treatment method could potentially offer cost savings, accelerate the mission and direct applications of technologies to specific hazards.

Rob Hastings, DOE Assistant Manager for Tank Farms, explained that Direct Feed Low-Activity Waste (DLFAW) is still the top priority for Hanford. Grout is the front runner for alternative treatment. The issues with grout are related to some chemicals they cannot treat well, such as Polychlorinated Biphenyls

(PCBs). Vitrification would be a better route for those chemicals. Disposing of waste in Texas is preferred because DOE believes the geology at the Texas disposal facility is substantially better than at Hanford.

Suzanne Dahl, Ecology Project Manager, explained that in Ecology's opinion, all tank waste is high-level waste. Ecology believes grout has not been found to be adequate to protect workers and the environment. Grout should meet the "as good as glass" standard, especially if it is going to be buried. The disposal requirements are different in Texas which is an exciting prospect. Ecology is happy to work with DOE on the permitting with that.

Committee Member Questions (Q), Responses (R), and Comments (C):

Note: This section reflects individual questions, comments, and agency responses.

Q: "What about IDF [Integrated Disposal Facility] and TBI [Test Bed Initiative]? Should the HAB write advice to move it forward?"

R: "We are working on some actions this week so that we can resubmit that permit application later."

C: "I do not believe we can safely leave technetium in grout. We should review what caused us to abandon grout last time. Technetium and iodine should go to Texas because that's better than in our Central Plateau."

R: "I think the grout technology is adequate for technetium. There are big hoops to get into IDF, so it's easier to go to Texas."

Q: "I've been hearing about this sizable cost savings for more than a year. Where is it?"

R: "We looked at six different scenarios: DFLAW, grouting, glass making, etc. We came out with around \$40 billion in savings."

After group discussion, committee members decided that they would not recommend that a letter from the HAB chair to the National Academy of Sciences should be sent.

A/AX Tank Farms Single-Shell Tank (SST) Retrievals

Agency Presentation

Jeremy Johnson, Deputy Federal Project Director for U.S. Department of Energy Office of River Protection (DOE-ORP), and Doug Greenwell, Manager of Washington River Protections Solutions (WRPS), provided members with an update on the A/AX Tank Farms Single-Shell Tank Retrievals.

Key Points from the presentation⁵:

- AX-102 operations started on August 31 using low-pressure sluicing. Sixty-nine percent (69%) of the waste was recovered.
- During the AX-102 operations, there were challenges associated with fogging and lighting primarily due to spraying of hot water.
- The wastewater is drained directly into the tanks.
- Bore holes were made underneath the tanks, and they are taking samples for Resource Conservation and Recovery Act (RCRA) closure.

⁵ A/AX Tank Farms Single-Shell Tank Retrievals

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- There are several tanks that are known as leakers. Some of the techniques could run the risk of driving contaminants into the environment. One technology is the mobile waste gathering system to grind waste. Another is the Hanford waste end-effector which offers both fluid injection and suction at the head so it is localized recovery of the waste that minimizes putting fluid into the tank. A third technology is the extended reach sluicer modification which adds vertical motion capability.

Committee Member Questions (Q), Responses (R), and Comments (C):

Note: This section reflects individual questions, comments, and agency responses.

Q: "Are you going to implement any other technologies to clean them out?"

R: "We are using the hot water and high pressure in conjunction with using caustic as a solution for the technology, and we are evaluating that right now."

C: "I was surprised you were using the applicator with both the liquid and suction retrieval. I'm not surprised you had a problem based on the history. I think you're on the right track."

Q: "Is this going to generate more liquid waste that will have to be handled by the evaporator, adding to our limited space?"

R: "The A/AX tanks are more salt cake, so we do use water. We minimize the amount of water we use when we have it on recirculation mode. We monitor the gravity of the fluid up until the level where we know it is as saturated as it will get. We customize the tools and liquids based on individual tanks."

Q: "I'm curious about the bore holes?"

R: "I would suggest a future presentation so we can go more in depth."

Q: "What is in the 105 tank now?"

R: "Residual waste left over from the previous attempts to remove waste in the 60's and 70's."

Q: "It looks like it will be a challenge. Will it be a good investment given all the challenges from this?"

R: "I expect this to be a discussion for the holistic negotiations."

Q: "What technology will be used for 105?"

R: "The MARS [Mobile Arm Retrieval System] vacuum system that we are still designing."

Q: "The sluicing is going well, and you're at 69%. What are you anticipating next?"

R: "We have retrieved salt cake in the past, and there is good progress in the past weeks. There is some sludge still at the bottom of the tanks, but we will make progress. Our operators are highly experienced and love what they do."

Committee Business and Wrap Up

The committee identified two agenda items for the next TWC meeting.

- Grout – A discussion of what board advice on grout might cover and approval for Issue Managers to proceed with the work.

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- Lateral Flow – A discussion of a path forward for work on the issue.

Attachments

Attachment 1: Introduction to the Ecology Alternative Model for Evaluation of Vadose Zone Heterogeneities in WMC C: Development of a 2-Dimensional Numerical Model Using STOMP

Attachment 2: Evaluation of Vadose Zone Heterogeneities Under Waste Management Area C

Attachment 3: A/AX Tank Farms Single-Shell Tank Retrievals

Meeting Attendees

Board Members and Alternates

Jeff Burrignt, Alternate	Vince Panesko, Alternate	Margery Swint-Yegge, Alternate
Shelley Cimon, Member	Gerry Pollet, Alternate	Chuck Torelli, Member
Susan Leckband, Member	Jacob Reynolds, Alternate	Tony Umek, Member
Kristin McNall, Member	Dan Solitz, Alternate	Steve Wiegman, Member
Marissa Merker, Alternate	Bob Suyama, Member	

Others

Rebecca Blackwell, DOE	Jim Alzheimer, Ecology	Ridha Mabrouki
Kaylin Burnett, DOE	Dib Goswami, Ecology	Sunil Mehta, CHPRC
Brian Harkins, DOE	Jeff Lyon, Ecology	Dana Gribble, MSA
Rob Hastings, DOE	Dan McDonald, Ecology	Man Tinpllit, PNNL
Doug Hildebrand, DOE	Ryan Miller, Ecology	Ashley Herring, ProSidian
JoLynn Garcia, DOE-ORP	Beth Rochette, Ecology	Ruth Nicholson, TWC Facilitator, ProSidian
Jeremy Johnson, DOE-ORP	Maria Slinue, Ecology	Adrian Woolcock, ProSidian
Albert Kruger, DOE-ORP	Jerrey Yokri, Ecology	Lindsay Strasser, North Wind
Rod Lobos, DOE	Tom Rogers, WDOH	Peter Bengston, WRPS
Jim Lynch, DOE		Marvel Bergeros, WRPS
Anne McCartney, DOE		Recolny Gnffwaice, WRPS
Gary Younger, DOE		Mall Laida, WRPS
		Paul Rutland, WRPS
		Dave Swanberg, WRPS