



MEETING SUMMARY

HANFORD ADVISORY BOARD (HAB)

Tank Waste Committee (TWC)

September 23, 2020

Virtual Meeting via Teleconference and GoToMeeting

Topics in this Meeting Summary

Opening..... 2

Direct-Feed Low-Activity Waste (DFLAW) Critical Path Update 2

A and AX Farm Retrieval Status 3

242-A Evaporator Update 4

Waste Incidental to Reprocessing (WIR) for Vitrified Low-Activity Waste (VLAW) 6

Committee Business..... 10

Attachments 10

Attendees 11

This is only a summary of issues and actions discussed at this meeting. It may not represent the fullness of represented ideas or opinions, and it 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, Benton County and TWC chair, opened the meeting.

The committee adopted the TWC May 2020 meeting summary.

Jim Lynch, U.S. Department of Energy (DOE), announced that Stan Branch, DOE, will be assuming the role of Deputy Designated Federal Officer (DDFO) for the HAB at the October full Board meeting. He also introduced Gary Younger, DOE, who has replaced JoLynn Garcia, DOE, as the Federal Coordinator for the HAB.

Dan McDonald, Washington State Department of Ecology (Ecology) shared that staff have been informed that they will be teleworking through June 2021.

Direct-Feed Low-Activity Waste (DFLAW) Critical Path Update

Erik Olds, DOE, spoke to the July schedule as they are currently working on the August schedule. There have been day-to-day slips on all of the DFLAW projects, especially the Waste Treatment Plant (WTP). The Hot Commissioning Date has changed on the July schedule to November 27, but the date will actually be in the December 2020 timeframe. There are margins in meeting the Consent Decree and Tri-Party Agreement (TPA) milestones. None of the other DFLAW projects are expected to affect the critical path.

Currently, the site is in Phase 2 mobilization, and 6,000 workers have been methodically returning to work. This week, the site should have more workers on site than teleworking. Some teleworking employees will be doing so for the foreseeable future even though COVID is less and less impacting.

The Tank-Side Cesium Removal (TSCR) unit has been moved from Richland out to the site this past Saturday. All of the components of the DFLAW system are physically in place. Now the focus is on integrating the interfaces on the projects, such as the physical connections between TSCR, the AP tank farm, and WTP.

Progress on the management is going well. A lot of progress has been made in the infrastructure. Mission Support Alliance (MSA) has not only been working on this work, but also on day-to-day activities, including cleaning, COVID control, security, and communications. MSA has also been working on the North Loop and South Loop transmission line and the water treatment facility.

DOE is keeping an eye on contract transitions.

Regulatory Perspectives

Dan McDonald, Ecology, noted that the remobilization plan is organized in phases, and each phase has specific criteria that must be satisfied in order to move to the next phase. There is no way to know when movement between phases will occur. Much of the work is now having to be done sequentially, so work progress efficiency will be different.

Committee Discussion

In response to a question about the False Claims Act Settlement court settlement that was announced yesterday, Erik Olds noted that since the announcement was just made, he would need to take the question back to find out more information on the issue.

In response to questions about other components of the critical path, Erik confirmed that there has been enough progress in the critical path that there are no new projects in the plan. He also explained that because nitrile is a product of the vitrification process, it will have a permitting component and is a good example of an upgrade that is needed. Erik did not have information on any comment periods associated with that permitting.

A concern was raised about the impact of COVID on how many workers the tank farm trailer can now support given the requirements for physical distancing. The questions were around infrastructure needs to support the workers and how that could impact work schedules, timelines, and budgets. Erik explained that the contractors are looking at how to do things differently now. They have added some additional things, like handwashing stations. At this point, Erik has not seen plans to add additional infrastructure. Erik confirmed that the remobilization plan is available. Gary Younger, DOE, agreed to find out how HAB members could get a copy of that plan.

There were a number of questions about pipelines and the Effluent Management Facility (EMF). A request was made to see how all of those elements fit together at the next committee meeting to help the committee understand that technical and administrative work involved. Erik noted that the EMF is still in progress and is not yet complete. He clarified that the EMF supports waste treatment, and the 242 Evaporator supports the tank farms and concentrating of waste. They are different. Erik added that the two evaporators are not connected. The committee requested that it get a better description of the piping from TSCR to the melters because it is important that the melters not go dry.

A and AX Farm Retrieval Status

Jeff Rambo, DOE, explained that they completed retrieval of Tank AX-102 to the limits of two retrieval technologies. In AX-102, there are ripples in the bottom of the tank, some of which appear to be 4-5 inches in height

The A-tank farm ventilation equipment was operational on August 30th, and now all six tanks are now on active ventilation. They are working on updating the cameras and lights that control the sluicers. Crews have been removing expired hose in hose transfer lines (AY farm to AP farm) and will complete removal in October.

In the AX tank farm, they are installing hose barns and doing electrical work. The hose barns are shield for the transfer lines that run from the AX sluicer pump to the DST receiver tank AZ-102. Excavations will be covered with steel plate shieldings. They also removed the AX-101 D pit riser pump so that riser can be used to install other equipment. Work has been going well.

The AX tank farms are a high priority now that the site is in Phase 2.

Regulatory Perspectives

Jeff Lyon, Ecology, indicated that his bottom line is how hard they are working in the tank farms and the amount of progress they are making despite COVID restrictions. They are doing great work. Ecology does have a concern about the retrieval equipment as there were some problems with installation. DOE is looking at sampling the residuals in AX-102, and Ecology thinks it is too early to do the sampling. It is risky and costly to do sampling. Ideally, you would have a Performance Assessment (PA) before sampling. DOE is planning on delivering a PA at the end of the month.

Jeff also brought up that there may be an evaluation done under the Consent Decree if there is a need for a third technology. Ecology can approve a third technology requirement.

He closed by emphasizing that DOE and its contractors are going tremendous work.

Committee Discussion

The discussion opened with questions about how all of this work is getting done in light of COVID restrictions and protocols with respect to the workers. Jeff Rambo indicated that they were probably losing one-third of the time in the field due to restrictions. Once workers get into the tank farms, they are well-protected. There are restrictions in the tents where workers put on their masks which has slowed things down. There are also checklists for people to guide them. Initial screening of workers for COVID is usually just a temperature check. If needed, they get evaluated, go home, and consult with their doctor. Everyone who worked with an ill person is notified that they may have been exposed. If the COVID test is negative, everyone can return to work after all has been sanitized. Workers will return to a four, 10-hour day work schedule in the future. For now, we had to switch that work schedule due to COVID, so workers are on both day and night shifts.

With respect to questions about a third technology for retrieving waste, Jeff Rambo explained that the first two technologies should have found about 12,000 gallons of waste. However, the floor pump was elevated 2-4 inches which can throw off the estimate. They are working on getting a better estimate which will help identify the next steps. When the pumps are pulled out of a tank, they are sprayed with water to reduce the contamination, put on trucks, and shipped to the Environmental Restoration Disposal Facility (ERDF). There are a lot of unknowns about a third technology, including speculation about the use of chemicals that can dissolve waste, flexible pumps, or other ways to catch the waste and remove it. Infrastructure is also a critical piece of the puzzle.

DOE is carefully watching the two tanks (A-104/A-105) that it knows are leakers.

The committee noted that success in retrieval creates a new problem for storing and processing the waste that is retrieved.

The committee chair asked that this topic be included on the November TWC agenda, particularly regarding the third technology and the findings of the PA.

242-A Evaporator Update

Paul Hernandez, DOE, explained that the 242-A Evaporator is designed to concentrate the waste stored in the tank farms. Waste volume reduction is accomplished through an evaporation process. The 242-A

Evaporator removes water from the waste in double-shelled tanks which frees up space to receive waste retrieved from single-shelled tanks. The water is removed by boiling it.

Waste comes to the Evaporator for treatment from Tank AW-102. The two streams that are created are a concentrated slurry stream which is sent back to the double-shelled tank system for storage and future treatment and a process condensate stream that is sent through an underground pipeline to the Liquid Effluent Retention Facility (LERF).

There is a new reboiler kept on site in the event that the existing Evaporator boiler needs to be replaced. The current boiler was finished in 1977. It would take up to two years to design and procure a new boiler without this backup equipment. Regarding another important piece of equipment, the PB-1 pump has been replaced with a refurbished pump. The pump takes the slurry from the Evaporator and sends it to the double-shelled tank farm. The 242-A Transfer Line is also being replaced.

Regulatory Perspectives

Andrew Pomiak, Ecology, explained that the 242-A Evaporator is operated under a Resource Conservation and Recovery Act (RCRA) permit issued by Ecology. Ecology is working on both the Evaporator permit and a second permit for LERF.

Committee Discussion

Committee members were concerned about staffing for the project during COVID and what it will take to get the Evaporator back up and running. Paul Hernandez explained that the Evaporator is staffed all the time. They watch tank volumes carefully, and it is very important to remove excess water from the tank waste. If DOE does not get permit approval by February 2021, then there would be day-to-day slips to the work which, at some point, could affect the critical path.

Ecology has requested a Class 3 permit for this project. Originally, the permit was to be a Class 2. It became a Class 3 when in the informal review of the permit modifications, discussion indicated that we had design questions and other comments based on changes in the permit. Ecology is not willing to entertain a request for a temporary authorization to enable moving soil outside of the Evaporator or starting other work.

In response to how long workers can be inside the Evaporator, they have to be dressed out, their time is limited, and doses are individually tracked. Paul was not sure what the time limit was. He agreed to get more information for the committee.

With regard to questions about the critical path and DFLAW, Paul explained that the Evaporator is independent of what is going on at DFLAW. The Evaporator is expected to operate until 2054.

In response to questions about the Evaporator shut down, Paul noted that the shutdown occurred after there were vibration problems, and integrity testing found that the secondary piping was not holding pressure. That raised an alarm. Since then, DOE has been racing to get a new transfer line. There has been a lot of research on the failed line.

In response to a question about the type of work that occurs around the clock, Paul said that workers staff the control room, as well as handling preventative maintenance, corrective maintenance, and other safety

requirements. Every treatment campaign is called a batch, and there are not more than 2-3 campaigns in a year. Each campaign is dependent on the availability of waste to process. Less than a dozen people are involved in a campaign.

The committee would like a future update on this topic when the TPA agencies have more information to share. There is interest in the integrity testing program on the piping. The suggestion was that an update in Spring 2021 would make sense after the permit is approved and work to replace the lines is underway.

Waste Incidental to Reprocessing (WIR) for Vitrified Low-Activity Waste (VLAW)

Gary Pyles, DOE, explained that DOE has prepared a Draft WIR Evaluation to assess whether VLAW can be safely disposed in Hanford's Integrated Disposal Facility (IDF) as low-level radioactive waste. This is an important part of the DFLAW mission. This process is a 12-18-month public process with the Nuclear Regulatory Commission (NRC). DOE shares all public comments with NRC and many DOE/NRC meetings will be open to the public to observe. DOE and NRC post a summary of all public meetings.

A WIR Evaluation is not required for secondary solid waste because it is considered newly generated waste from a waste treatment facility.

The draft WIR Evaluation and supporting technical documents demonstrate that VLAW meet the criteria determining waste to be incidental to reprocessing and acceptable for IDF disposal:

Waste has been or will be processed to remove key radionuclides to the extent that is technically and economically practical,

Waste will be managed to meet safety requirements comparable to the performance objectives in 10 CFR 61 Subpart C, and

Waste will be incorporated in a solid physical form that does not exceed the applicable concentration limits for Class C low-level waste.

Comments should be submitted by November 27, 2020.

Dave Darling and Pat Lee, Washington River Protection Solutions (WRPS), discussed the Draft WIR Evaluation in more depth. The Evaluation addresses about 23.5 million gallons of VLAW and whether it may be disposed on at IDF. It does not address other wastes. VLAW will be pretreated using DFLAW which is in two phases: Tank-Side Cesium Removal (TSCR) for Phase 1 and either additional TSCR or filtration/cesium removal capability for Phase 2. Pre-treated VLAW will be vitrified beginning in FY2023 and is planned to be disposed at IDF in approximately 13,500 containers.

The DFLAW pre-treatment has three components:

In-tank settling and decanting to separate supernate and dissolved saltcake from solids where radionuclides tend to be entrained.

Filtering to remove most of the remaining insoluble radionuclides. The majority of the radionuclides in the resulting liquid will be cesium-137, technetium-99, iodine-129, and possible strontium-90.

Crystalline silicotitanate ion exchange to remove cesium-137 and uranium, strontium-90, neptunium, and plutonium, if present.

The DFLAW pre-treatment process addressed WIR Criterion #1 regarding the removal of key radionuclides.

The PA addressed Criterion #2 regarding safety requirements. The four performance objectives in 10 CFR 61, Subpart C address general requirements, protection of the general population from radioactive releases, protection of individuals from inadvertent intrusion, protection of individuals during operations, and the stability of the disposal site. VLAW waste has been evaluated by computer assessments through multiple land and groundwater pathways to ensure its disposal will be protective of human health and the environment.

IDF is Hanford's onsite disposal location for low-level and mixed Low-Level waste. It includes a double liner and Leachate detection system. When closed, it will also have a closure cap. The IDF performance analysis included consideration of pathways of exposure to a person who resides next to the facility and raises livestock. The analysis considered air, water, groundwater, and land pathways of exposure. The PA evaluates all waste disposed of at IDF including both VLAW and Secondary Waste to demonstrate protection to the environment and meet performance objectives. The conclusion is that there is a reasonable expectation that a dose to a member of the public in the future from waste at IDF will be below DOE's performance objectives and measures.

Concentration limits for waste in solid form are the focus of for Criterion #3. The Evaluation concludes that vitrifying VLAW satisfies these requirements largely by removing over 90% of the cesium.

The presentation closed with a review of the aerial photo of the planned configuration of the tank farms, Waste Treatment Plant, IDF, and the connecting transportation routes. They are working on the permitting now with construction continuing through next spring and summer on the IDF portions of the project.

Regulatory Perspectives

Dan McDonald, Ecology, organized Ecology's comments in response to the TWC framing questions on this topic.

1. **QUESTION:** How does the Draft WIR demonstrate that the vitrified low-activity tank waste can be safely disposed of at Hanford's Integrated Disposal Facility (IDF) as low-level radioactive waste?

RESPONSE: The WIR addresses the mechanisms that show that the radionuclides are reduced to extent possible and then factors in the risk. The WIR is based on a PA which looks at the risk. The end result is a waste that was High-Level Waste (HLW) and would have required deep geologic disposal, where the geology protects humans from the waste. In this case, the removal of radionuclides to extent possible and immobilization is what makes the disposal in a near-surface environment protective. At this time, no waste is generated by DFLAW on which to conduct tests; the accuracy of the WIR/PA analyses will require confirmation. Once waste is generated, there needs to be testing of that waste and analysis to confirm that this analysis safely bounds IDF disposal criteria.

2. **QUESTION:** How does the Draft WIR and supporting technical documents demonstrate that the VLAW disposed at the Integrated Disposal Facility (IDF) meet the relevant DOE Manual 435.1-1 Chapter II, section B(2)(a) criteria for determining waste to be incidental to reprocessing criteria.

RESPONSE: While Energy could have provided a clearer basis for this effort, in the past Energy has provided a basis for deciding that filtration and Cs-137 removal is all the pretreatment necessary to meet Criterion #1. For Criterion #2 regarding safety requirements, it is unclear what, if any, specific management actions might need to be taken to comply with this regulation.

3. **QUESTION:** What are the overall findings of the IDF PA?

RESPONSE: Glass is protective of the environment. Some of the secondary wastes are drivers to contamination of the groundwater. These wastes need to be treated in a more robust manner to be acceptable. Regarding RCRA/DW constituents: the results indicate that the impacts for the primary pathway, groundwater, are below the groundwater protection standard. However, under the Drinking Water regulations, it really is not acceptable for a RCRA landfill to have groundwater impacts.

4. **QUESTION:** How has the IDF PA addressed uncertainty, both in the model parameters and in alternative future scenarios evaluated? Are there any substantial differences from the way uncertainty was addressed in the WMA-C PA?

RESPONSE: Significant levels of uncertainty exist in the PA, in many respects, including waste types, volumes, how waste will react, and vadose zone characteristics. There is real concern about the potential for cumulative impacts because of uncertainties. In more than one case, assumption B and C were predicated on assumption A, and there did not seem to be sufficient information available to ensure that assumption A had a reasonable foundation for the assertions made. That, in turn, causes assumption B and C to be less than solid.

5. **QUESTION:** How have/will the recommendations in the NRC's final Technical Evaluation Report from the WMA-C WIR be incorporated into the WIR evaluation for the VLAW? Is continuous improvement happening from one WIR to the next?

RESPONSE: No Ecology response.

6. **QUESTION:** What are the other steps involved with "activating" the IDF for accepting tank waste by 2023? Ecology permit status? Waste Acceptance Criteria and waste verification process?

RESPONSE: Ecology is working with the permittee to complete the permit modifications necessary to issue the IDF operating permit. Those permit modifications are in progress. IDF currently has an existing 8c Permit. That permit is currently undergoing various permit modifications to add information to the permit. At some point, based on the PA review, Ecology will add appropriate information to the IDF permit conditions. It is possible that the WAC and verification process in permit addenda WAP will need to be modified. The Drinking Water permit includes a waste acceptance plan.

7. **QUESTION:** What is the planned administrative and technical path for the secondary wastes (both solid and liquid) produced during VLAW production? My understanding is that these secondary wastes are planned to be grouted and (I thought) also disposed at IDF. However, secondary solid wastes are explicitly outside the scope of the VLAW WIR (footnote 63 in the WIR evaluation). Are secondary liquid wastes within scope of this WIR? It is unclear in my read of the document.

RESPONSE: In Ecology's opinion, the secondary waste should be part of the WIR. Ecology is concerned that the WIR did not include secondary waste, and Ecology looks forward to DOE's explanation of why it was not included.

8. **QUESTION:** What constituents are expected to be in the secondary solid and liquid waste? Is Ecology ready to make any statements about chemical constituents in the secondary waste, i.e., I would assume that Ecology agrees with the chemical constituents that the PA focuses on.

RESPONSE: No Ecology response.

9. **QUESTION:** How has secondary waste been evaluated in the IDF PA and the WIR Evaluation? Has this additional source term been considered in the WIR evaluation as part of the "cumulative risk" contributors relative to the 10 CFR 61 performance standards?

RESPONSE: Ecology looks forward to DOE's responses regarding cumulative risk. Additionally, Ecology hopes that DOE's responses includes discussion of the cumulative risk from other waste sites sources that can reasonably be expected to impact the environment, e.g., other sources of groundwater contamination that will be combined with the IDF contribution.

10. **QUESTION:** What is Ecology's perspective on secondary waste disposal at IDF?

RESPONSE: The exclusion of secondary waste in the WIR is disconcerting. Ecology is carefully evaluating the secondary waste information in the PA to determine if the Drinking Water Protection controls are adequate for the chemical constituents. As a concerned stakeholder, Ecology is also carefully evaluating the radiation impacts. It is Ecology's assumption that secondary waste will be added to approved waste streams for disposal at IDF, and one of the ongoing permit modifications includes this. However, Ecology knows that some specific secondary waste streams push the boundary of acceptable groundwater impacts, and Ecology is likely to consider mitigation.

11. **QUESTION:** Will the administrative and technical path for secondary waste also be ready to go by 2023?

RESPONSE: There is a lot of work yet to complete. Ecology supports Energy in completing DFLAW and beginning that treatment mission. It is unclear what impact the COVID pandemic might have on achieving the 2023 milestone.

Committee discussion

The discussion opened with committee members commenting that cumulative risks are a big issue here, and that there has not been testing done on the waste so it is difficult to discern how much of the waste is low activity and how much is considered HLW. Gary Pyles responded that he believes that currently all

tank waste is being managed as HLW. The WIR Evaluation only looks at what is going to be treated with the DFLAW approach.

In response to a question about what happens from the resin that comes from TSCR, Gary clarified that they will not be disposed in IDF, and they are not included in the analysis. He believes they will be put on a pad and disposed of as HLW.

Comments were made regarding a preference to hear about waste leaving the Hanford site instead of being disposed on site.

The committee determined that it did not need to create an Issue Manager team for this issue.

Committee Business

The committee discussed nominations for the upcoming HAB chair, vice chair, and national liaison positions. Susan Leckband will not be running for another term as HAB chair. Shelley Cimon would like to run again for vice chair, and Pam Larson would like to continue on as national liaison.

The HAB membership package is still under consideration at DOE-Headquarters and has not yet been signed.

The committee identified additional topics it would like on the TWC November agenda:

Discussion with the TPA agencies about the perceived value of HAB advice and further definition of “actionable” advice

Update on the vitrification plant

Characterizing pipelines and problems with what happens when you put solids in pipelines that plug them up

Composite analysis

Annual Groundwater Report.

Attachments

Attachment 1: DFLAW Integrated Schedule – July 2020

Attachment 2: 242-A Evaporator Update

Attachment 3: Draft Waste Incidental to Reprocessing (WIR) Evaluation for Vitrified Low Activity Waste (VLAW) Disposed Onsite at Hanford

Attachment 4: Draft Waste Incidental to Reprocessing Evaluation for Vitrified Low-Activity Waste Disposed of Onsite at the Hanford Site, Washington

Attachment 5: IDF Photo

Attendees

Board Members and Alternates:

Jeff Burrigh, Member	Becky Holland, Member	Marissa Merker, Alternate
Shelley Cimon, Member	Pam Larsen, Member	Vince Panesko, Alternate
Robert Davis, Member	Bob Suyama, Member	Jacob Reynolds, Alternate
Dan Solitz, Alternate		

Others:

Kelly Ebert, DOE	Lindsay Strasser, AttainX	Wayne Barber, Weapons Complex Monitor
Paul Hernandez, DOE	Larry Romine, ISMS	David Darling
Jim Lynch, DOE	Coleen Drinkard, MSA	Alex Klementiev (awaiting appointment to the HAB)
Marco Kaltofen, DOE	Ashley Herring, ProSidian	Pat Lee
Erik Olds, DOE	Ruth Nicholson, HAB facilitator, ProSidian	Kira McCoy
Gary Pyles, DOE	Buddy Cunningham, WRPS	Kelsey Shank
Jeff Rambo, DOE	John Eschenberg, WRPS	Maria Skorska
Brian Stetter, DOE		Michael J Turner
Gary Younger, DOE		
James Alzheimer, Ecology		
Jeff Lyon, Ecology		
Dan McDonald, Ecology		
Andrew Pomiak, Ecology		
Ginger Wireman, Ecology		
Tom Rogers, DOH		