



Draft Meeting Summary

HANFORD ADVISORY BOARD

River and Plateau (RAP) Committee Meeting

November 17, 2020

Virtual Meeting – GoToMeeting and Teleconference Line

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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, 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

Jan Catrell, League of Women Voters and RAP chair, welcomed meeting participants.

The RAP committee adopted the meeting summary for its September 2020 virtual meeting.

Stan Branch, U.S. Department of Energy (DOE), announced that this meeting was being held in accordance with the Federal Advisory Committee Act.

Groundwater Program Overview

Michael Cline, DOE, provided a “groundwater 101” overview of issues and activities at Hanford. During reactor operations, chemical and radioactive waste were released that contaminated the soil and groundwater beneath portions of the Hanford site. The purpose of this presentation was to help people understand what is being done with respect to the requirements of groundwater programs and cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Tri-Party Agreement (TPA).

The key goals of the groundwater program are to protect the Columbia River and groundwater from further contamination and restore groundwater to its highest beneficial use. To that end, DOE has ceased discharge of unpermitted liquids, remediated waste sites in the 100 and 300 Areas, and operated pump and treat facilities.

DOE has installed thousands of wells to monitor groundwater. As of January 20, 2020, there are 3,296 unique well locations. New well proposals are approved annually under the TPA. Wells monitor the extent of contaminants of concern in plumes and support pump and treat operations. Results are documented in the annual Hanford Site Groundwater Monitoring Report. Michael Cline showed a number of photos of how wells are drilled and how samples are taken.

The predominant groundwater contaminants in the Columbia River corridor are hexavalent chromium, nitrates, and strontium-90. Groundwater is a significant pathway for contaminants to enter the Columbia River.

In the Central Plateau, the predominant contaminants are carbon tetrachloride, trivalent and hexavalent chromium, cyanide, nitrates, trichloroethene, iodine-129, technetium-99, and uranium.

There are five pump and treat facilities along the Columbia River and one on the Central Plateau. In addition, there is a permeable reactive barrier for strontium-90 in the 100-N Area, enhanced attenuation of uranium in the 300 Area, and monitored natural attenuation for uranium in the 100-F Area.

As of September 30, 2020, groundwater cleanup progress included:

- 26 billion gallons of groundwater treated,
- 4,169 kilograms of hexavalent chromium removed,
- 112,653 kilograms of carbon tetrachloride removed,
- 494,227 kilograms of nitrates removed,
- 976 kilograms of uranium removed, and

- 17 curies of technetium-99 removed.

Michael Cline shared a number of photos of pump and treat facilities and their equipment, primarily in the Columbia River corridor. The presentation included colored graphs and maps illustrating the progress in reducing contaminants and shrinking contaminated groundwater plumes. One example was the hexavalent chromium plume in the K Reactor Area which has been under active remediation since January 2007. By January 2016, all monitoring wells indicated groundwater was below the groundwater remediation target. A rebound study was performed between May 2016 and March 2017 which indicated that a continuing hexavalent chromium source exists in the area. The presentation also included a summary map showing the remaining work in the River Corridor in the Orchard Lands, 100 Areas, 618-10 burial grounds, and the 300 Area (page 31).

DOE started remediation of groundwater in the Central Plateau in 2012 using the 200 West Pump and Treat Facility. Groundwater is treated until contaminants are below drinking water standards or can be shown to attenuate during the remediation period. The presentation included a colorful map of the complicated network of wells in the Central Plateau (page 34) as well as photographs of the pump and treat facility. It also contained colored graphs showing the decrease in technetium-99 and chromium contamination. Following treatment, the water is reinjected into the aquifer as a recharge source and to promote flow-path control.

The permeable reactive barrier was formed by injection of a calcium-citrate-phosphate solution to form a mineral barrier called apatite which bonds with strontium-99. The barrier is 762 meters along the river shoreline. Barrier performance is monitored by 29 wells.

The 300 Area Uranium Sequestration project is based on the infiltration and injection of phosphate solutions into the vadose zone, periodic wetted zone, and groundwater. This forms insoluble minerals that bind uranium. The Record of Decision was signed in 2013, and the report was issued in September 2020.

Michael Cline also briefly discussed the Cumulative Impacts Evaluation (CIE). The technical approach document was issued in September 2020, and all hardware has been installed to conduct the analysis. The project includes independent peer review. Calculations will be made for a No Further Action Scenario as well as for the Most Anticipated Scenario. Other CIE activities include gathering data to address additional sources of anthropogenic recharge, maintaining the soil inventory model, and assessing data gaps in vadose zone hydraulic properties.

Groundwater remediation began 20 years ago under interim cleanup decisions under CERCLA. Over that time, process improvements have resulted in substantial progress in the removal of groundwater contaminants. The ultimate goal is the protection of the Columbia River.

Regulatory Perspectives

EPA is in the middle of working through comments on the draft Interim Record of Decision (ROD) for BP-5. It hopes to have decisions for the Interim ROD in September or October 2021.

Dib Goswami, Washington State Department of Ecology (Ecology), noted that it was a great presentation by DOE that had plenty of slides to explain the groundwater topic clearly.

The active groundwater remediation program started around 1995 after the development of the Hanford Site Groundwater Remediation Strategy document around that time. The TPA agencies received a lot of input from stakeholders, the state of Oregon, and Tribal Nations. Initially, the remediation started with a few pilot scale pump and treat systems in the Central Plateau. Later on, it expanded to the 100 Area. From the initial about 75 gallons per minute removal, pump and treat work expanded to more than 5,000 gallons per minute. It is a tremendous achievement. One of the primary goals is to protect the Columbia River from contaminants going to the River. Today, we have stopped the chromium going to the river by more than 98%.

Dib Goswami went on to explain that since the 1990s, we have also discovered that the tanks have leaked and impacted the groundwater. We also found that due to the large-scale pump and treat operations in the 200 West Area, the Resource Conservation and Recovery Act (RCRA) groundwater monitoring network at various facilities was impacted. We carried out proper engineering evaluation of the impact in the last three years and are trying our best to maintain the required monitoring network at those facilities. We have identified more than 60 new wells to monitor these facilities. These wells will be installed as per the M-24 milestone in the TPA. We also expect further impact from the implementation of the optimization study. One of the challenges to detect any leak from these facilities is to carry out proper sampling methods. We are exploring the use of low flow sampling technology.

Committee Discussion

The question was asked what is done if a contaminant is detected in groundwater in a cleanup area and how is the source of the contaminant determined. Michael Cline responded that monitoring is a key tool here to track how much water is used in excavations and if that pushes contamination into groundwater.

Members were interested in funding for groundwater activities, including proposed funding in fiscal year 2022 for the 100, 200, and 300 areas and if the requested funds will support expansion of pump and treat operations for Gable Gap and the 200 West facility, as well as for mediation at the B and C reactor areas. Michael Cline explained that DOE will not know the answers to those questions until 2021.

Some of the wells and sampling activities were off-line because of the need to expand the availability of Personal Protective Equipment (PPE) at a time when it needed to be saved for other site work and for health care workers. There was also some impact from the time lost due to the smoke and air quality issues this summer. DOE has been discussing a priority strategy with both EPA and Ecology, and now that some work has resumed on site, wells and sampling activities have also resumed.

For those committee members who expressed an interest, the results from the uranium sequestration project are in the Administrative Record.

With respect to the plume maps, Michael Cline noted that DOE anticipates that the plumes will continue to shrink over time. There are sampling analysis plans for the pump and treat operations, and the related milestones are being met.

In response to a question about using pump and treat instead of the Effluent Treatment Facility (ETF) for the Environmental Restoration Disposal Facility (ERDF) and Integrated Disposal Facility (IDF), Michael Cline explained that ETF is significantly more expensive than pump and treat for this work.

Open Forum

Tom Sicilia, Oregon Department of Energy and RAP vice chair, offered an overview presentation of the issues listed as requested topics on the RAP work plan. He wanted to provide the new HAB members and those potentially interested in becoming RAP Committee members some informal background on the topics that have attracted RAP attention.

The requested topics from September 2020 were:

- ERDF
- Budgetary impacts on River and Plateau work (joint with the Budgets and Contracts Committee)
- Order of demolition of Canyons
- Orphan waste
- Composite Analysis
- Waste Encapsulation Storage Facility (WESF)
- Technical impracticability on Iodine on Central Plateau
- Response to advice on Aging Structures and 100 BC
- Recover mode process plan
- 324 update
- Plutonium Finishing Plant (PFP)
- 300 Area SF-5 and 100K
- T Plant
- RASCAL

Since September, three additional topics have been identified:

- Update to Five-Year Vision “placemat” for the Hanford site
- 200-W Pump and Treat optimization for carbon tetrachloride
- Central Plateau Principles have been added to the TPA.

The HAB has issued four pieces of advice related to ERDF: #2, #75, #219, and #281. ERDF is a large CERCLA landfill designed to take wastes from the Central Plateau with specific acceptance limits and total limits for specific radionuclides. It cannot take certain wastes, such as tank waste and transuranic waste. Tom proposed the following framing questions for a RAP discussion about ERDF:

- EPA and Ecology were concerned that the soils used to ensure that DDDD wastes are properly disposed are clean, rather than contaminated. “Dirty dirt” is a more appropriate fill source, since there is no shortage on the site, and space may be limited.
 - How much space do we need, and how much space do we have remaining in ERDF?
 - Where does ERDF stand in regard to its total limits on certain radionuclides?
- Is there a publicly available performance assessment for ERDF?
- Who decides whether a waste is appropriate for ERDF?

WESF is a big pool that shares a wall with B Plant. It contains cesium and strontium capsules that contain tank wastes. There is a concern about the integrity of the concrete surround the pool, so the plan is to take the capsules out of the water and move them to dry storage. This work falls under Milestone M-092-21 in the TPA. Tom proposed the following framing questions for a RAP discussion on WESF:

- How is the project progressing?
- Has there been a day-for-day milestone slippage due to COVID?
- Is there a seismic study being conducted?
- Why was the storage pad location altered? What waste was encountered?
- What would it take for the cannisters to fall “below the line”? (a reference to budget and funding)

The 324 Building was used to research vitrification. In 1986, tank waste leaked through the floor of the building. This was found after preparations had started for demolition of the building. There have been periodic work stoppages due to spread of extremely radioactive contamination. Tom proposed the following framing questions for a RAP discussion of the 324 Building:

- How has COVID impacted the schedule? What milestones are going to need to move?
- Have work modifications been made to prevent additional contamination spread to the work force?
- CH2M Hill Plateau Remediation Company (CHPRC) did some calculations based on a Pacific Northwest National Laboratory (PNNL) report that says that up to ~700 gallons of water a day can be used during excavation without impacting groundwater. RAP would like someone to speak to these calculations.
- It is anticipated that the wastes will eventually go to ERDF. How does this fit with ERDF's waste acceptance criteria since the contamination is tank waste?

RAP is waiting for TPA responses to three pieces of advice:

- #303 (December 2019)
- #306 (June 2020) – EPA has responded to this advice.
- #308 (October 2020).

The framing question proposed for the Recovery Mode Process Plan is: How are projects weighted when deciding what to begin in Phase 2 remobilization?

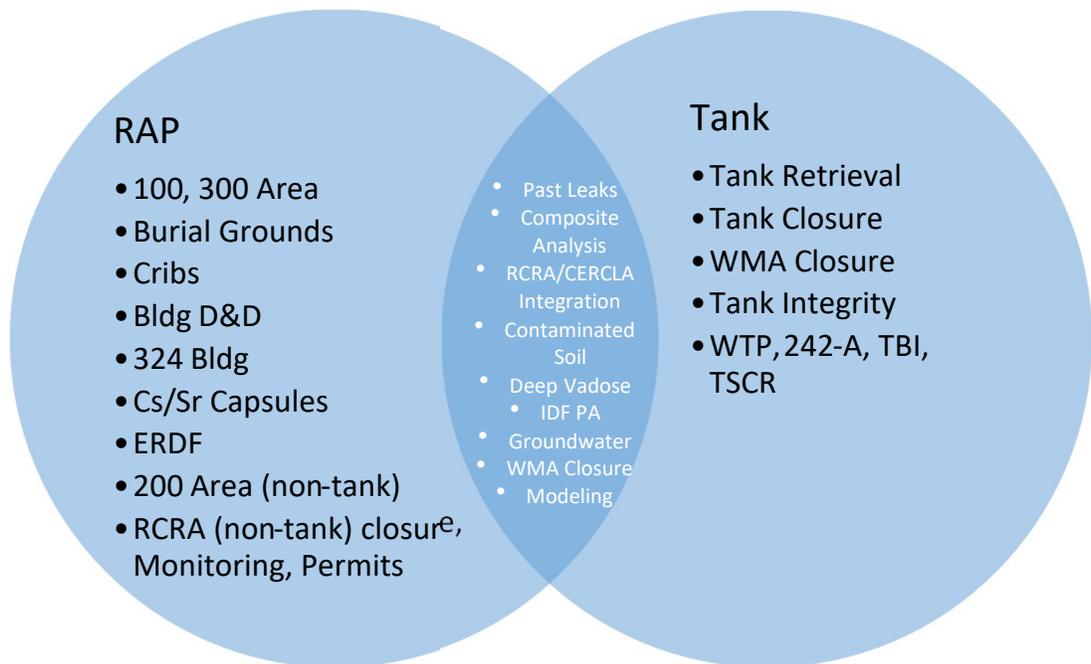
With respect to the 200-W pump and treat for carbon tetrachloride, the 2014 Record of Decisions anticipated a 95% reduction of contaminants in 25 years of pumping, then compliance in about 100 years of monitored natural attenuation. In contrast, a 2014 PNNL study says that the carbon tetrachloride will take ~630 years to decay instead of the anticipated 41 years. The plume core is larger than anticipated. RAP would like a briefing on this topic.

In October 2019, DOE presented a Five-Year Vision for the Hanford site to the HAB. This vision forms the framework for HAB advice on cleanup priorities. There is a concern that unless an update is shared with the HAB in December 2020, the cleanup priority advice may be delayed until late summer 2021.

The Central Plateau Principles and Procedures was added as a reference document to the TPA. This formalizes the RASCAL teams.

With respect to River Corridor treatments in the 100K and 300 Areas, there are two promising remediation and treatment methods being used. The RAP would like annual updates on these. In the 100K Area, unsaturated soils are being flushed with clean water to clean out hexavalent chromium. Preliminary results are encouraging. In the 300 Area, chemicals were injected at and above the water table to create a time release capsule for addressing uranium in the soils. RAP is interested in the results of the effort.

RAP has requested annual updates on the Composite Analysis, Cumulative Impact Evaluation, and Groundwater Monitoring. This may be a joint topic to share with the Tank Waste Committee (TWC). See the diagram offered by Tom Sicilia as an explanation of the typical topics that fall under the purview of the RAP and TWC Committees and how they overlap.



Orphan wastes are those with no identified disposal pathways. They include vitrified waste that is not from the Waste Treatment Plant, such as the German logs and the test logs in PUREX Tunnel 2. Other wastes include the cesium and strontium capsules, the Tank-Side Cesium Removal (TSCR) columns, 291-B HEPA filters, and soils that have been contaminated with high-level waste.

The Central Plateau Facility Schedule includes PFP slab sampling as well as non-time critical removal actions at B Plant, PUREX, and REDOX.

Tom wrapped up his presentation by identifying a few additional topics that are not pressing in time but are also of interest to RAP:

- SW-2
- M-091
- Gable Pond cover
- 618-11
- Canyon disposition
- Central Plateau characterization.

Other Committee Discussion during Open Forum

Committee members discussed concerns with major contract transitions on site and the side effects of confusion and learning how to conduct work with a new team. Gary Younger, DOE, indicated that once DOE gets the switching of contracts completed and work up and going, it hopes to have more information to share with the HAB at its December meeting.

The group was appreciative of the groundwater presentation from Michael Cline at this meeting. It acknowledged the complexity of the topic and identified three framing questions for future RAP discussions:

- Define terms used in Executive Summary of 2019 Groundwater Monitoring Report
- Define the 4 or 5 different monitoring programs

- Define different cleanup levels (5 levels)

Committee Business

The committee identified the following topics of interest for its next meeting:

- Gary Younger, DOE, suggested that worker and traffic safety and the Hanford fire department might be topics of interest that overlap the RAP and the Health, Safety, and Environmental Protection Committees.
- Request that each of the TPA agencies fill in the end of this sentence: Fiscal Year 2021 will be successful if... (complete this sentence). This would enable the compilation of a bulleted list of measures of success to track.
- ERDF briefing
- PFP rubble
- Composite Analysis

Before the meeting concluded, Ruth Nicholson, HAB facilitator, reminded RAP members that HAB leadership elections would take place at the December HAB meeting. There are three nominated candidates for HAB chair at this time: Jan Catrell, Emmitt Jackson, and Steve Wiegman.

Attachments

- Attachment 1: [RAP Agenda](#)
- Attachment 2: [Soil and Groundwater](#)
- Attachment 3: [2020 HAB RAP Topics](#)

Attendees

Board Members and Alternates:

| | | |
|-------------------------|-------------------------|---------------------------|
| Steve Anderson, Primary | Dan Solitz, Primary | Marissa Merker, Alternate |
| Susan Coleman, Primary | Steve Wiegman, Primary | Vince Panesko, Alternate |
| Tom Galioto, Primary | Jan Catrell, Alternate | Tom Sicilia, Alternate |
| Mohamed Osman, Primary | Larry Halder, Alternate | Chris Sutton, Alternate |

Others:

| | | |
|--------------------|----------------------------|---------------------------------------|
| Stan Branch, DOE | Lynne Hood, EPA | Mark C |
| Michael Cline, DOE | Emy Laija, EPA | Wayne Barber, Weapons Complex Monitor |
| Gary Younger, DOE | Alicia Boyd, Ecology | Lindsay Strasser, AttainX |
| | Stephanie Brasher, Ecology | Coleen Drinkard, MSA |
| | Dib Goswami, Ecology | Tyler Oates, MSA |
| | Ryan Miller, Ecology | Ashley Herring, ProSidian |
| | Tom Rogers, DOH | Ruth Nicholson, HAB facilitator |