

FINAL MEETING SUMMARY

**HANFORD ADVISORY BOARD
COMMITTEE OF THE WHOLE MEETING
October 5, 2010
Richland, WA**

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

SESSION 1 - INTRODUCTION

Susan Leckband, Hanford Advisory Board (HAB or Board) chair welcomed everyone and introductions were made.

Susan Hayman, EnviroIssues, reviewed the agenda for the Committee Of The Whole (COTW) and read the workshop objectives:

1. Provide the opportunity for HAB members to gain knowledge of the physical setting, operational history and burial information, characterization results and environmental monitoring, and public involvement and regulatory decision processes related to the radioactive Solid Waste Burial Grounds (SWBG or 200-SW-2 Operable Unit).
2. Highlight HAB interests surrounding the radioactive solid waste burial grounds for Tri-Party Agreement (TPA) Agencies’ consideration during revision of the 200-SW-2 Remedial Investigation / Feasibility Study (RI/FS) Work Plan in 2011.

3. Provide the TPA Agencies with informal feedback on presentation materials for upcoming regional public meetings.

At the end of the workshop Susan H. said HAB members will provide specific feedback regarding the public workshops.

Susan H. also explained that there will be an opportunity to post comments during the poster session, and that this process described at the first poster session. She asked participant to hold all but clarifying questions until the discussion portion after the presentations.

Matt McCormick, Department of Energy-Richland Operations Office (DOE-RL), provided context to the Hanford site cleanup completion framework document. There are overarching goals for cleanup and relationships between the river corridor, central plateau, and tank waste. He said there are stages of cleanup completion that build upon the 2015 vision, Central Plateau strategy, and new tank waste completions milestones.

Matt said the key challenges for the SWBGs include finding out what materials are available and the risks to human health. He said an important component is shrinking the footprint of sites, and treating and disposing contamination at the center of the site at the Environmental Restoration Disposal Facility (ERDF).

Matt said the Central Plateau cleanup approach will be divided into the inner area, outer area, and groundwater. For the inner area the goal is to minimize the final footprint to less than ten square miles. He said DOE will ensure waste disposal and residual contamination are not harmful to human health and the environment. There will be comprehensive and consistent cleanup decisions implemented using a geographical approach. He said the inner area will be monitored to ensure cleanup remedies are protective. DOE is nearing completion of milestones for the Central Plateau, and then decisions will be made that are protected by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). He said the outer area approach will clean waste sites comparable to the River Corridor, with some exceptions. He said DOE will demolish and dispose excess facilities and make final cleanup decisions with therecord of decision (ROD). He said this cleanup will start with interim CERCLA actions using American Recovery and Reinvestment Act (ARRA) funds. He stated that outer area actions will be done between 2015 and 2020. The goal for groundwater on the Central Plateau is to meet drinking water standards, and the focal point will be to treat the contaminants of potential concern. DOE will complete groundwater remediation on the Central Plateau using existing decisions as a model. He said DOE will implement pump and treat systems in the next few years to continue to remove and contain key contaminants. He said there is a challenge with the deep vadose zone, and DOE is pursuing multiple approaches to find effective long-term solutions for these challenges. He said Hanford will be a research center for deep vadose zone contamination techniques.

Matt said DOE is early in the decision making process for the SWBGs; that is, in the remedial investigation phase. He said there will be a work plan with characterization, and a feasibility study will be completed through public process to help determine a remedy. He said DOE looks forward to feedback and is just starting the discussion.

Jane Hedges, Washington State Department of Ecology (Ecology), said that today will provide a good background on what has been done and what remains to be done with regards to the SWBGs. She said there are some critical decisions that need to be made and DOE will need input. She discussed the regulatory history of the SWBGs and said there are three terms used: landfills, burial grounds, and trenches. She said that TPA involvement started back in 1998 and extensive work was done in the early 2000 period on monitoring and testing, culminating in a draft work plan. She said DOE and Ecology agreed that the work plan needed to be revised. She said DOE has started initial work. Phase two of the work plan under the new tentative TPA agreement is due by December 2011, with a proposed decision due in 2016.

Dennis Faulk, Environmental Protection Agency (EPA), said the HAB is getting involved very early in the process for this topic. He said the HAB should consider what they think DOE should investigate and what actions should be taken. He said he has a presentation on Idaho regarding buried waste that he can give later in the morning to provide lessons learned. He said for CERCLA regulatory processes, EPA is here as a regulatory agency and does not engage until the ROD process.

Susan L. provided an overview of HAB advice to showcase values related to buried waste. She said there has been over fifteen years of consistent HAB advice about buried waste and burial grounds. The HAB has advised DOE to integrate characterization and cleanup activities, cease importation of waste, regulate burial grounds, perform additional analysis, consider the cumulative impacts of unlined trenches, use Remove, Treat, and Dispose (RTD) over caps, and keep long-term protectiveness a high priority.

Susan L. said in HAB Advice #170 regarding Hanford buried waste, DOE was advised to appropriately plan for environmental remediation and to characterize all areas containing radioactive or chemical contamination. She said decisions should be based on risk and supported by field sampling and analysis, and should include unquantified materials in the planning actions. She said DOE should request and make funds available to adequately characterize and carry out resulting actions, and DOE's baseline should include this scope of work.

HAB Advice #173 (2005) discusses Central Plateau values and was well thought out with a flow chart. The Board's ideal for remedial action at all Central Plateau wastes sites is to characterize, retrieve, treat and dispose of all wastes. She said Hanford waste that remains on-site must be left in a configuration that will be protective of human health and the environment. If there is a risk of contamination the Board has a bias for RTD. She said that barriers should be a last resort remedy and the TPA should use a values-based algorithm for Central Plateau remediation decision making.

Susan L. said HAB Advice #207 reinforces the HAB value that "like waste poses like risks". She said TPA agencies should commit to adequate characterization and RTD of Plutonium (Pu)-rich wastes. She said TPA agencies should ensure that soils contaminated with TRU elements will be retrieved and have a pathway for disposal into the Waste Isolation Pilot Plant (WIPP).

Susan L. said HAB Advice #226 on the Central Plateau cleanup completion strategy was given in 2010. She said the Board suggested that burial grounds need attention and characterization and suggested DOE drop the presumptive remedy approach. She said the

current and future threat needs to be determined for the unlined trenches and cribs or other liquid waste discharged units. In this advice the Board also encouraged DOE to progress through cleanup of Hanford with a “RTD if possible” attitude.

Susan L. referenced HAB Advice #229 regarding the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS). This advice suggested there be an alternative that does not use Hanford as a national radioactive waste disposal site. She said the TC&WM EIS should present an alternative which will exhume and dispose of significant quantities of Hanford’s long-lived radioactive waste off-site. She said the draft TC&WM EIS should also include documentation of all hazardous chemical constituents and adequately report all chemical inventories from all disposal sites at Hanford.

Susan L. said Advice #231 on proposed changes to the TPA for Central Plateau cleanup suggests that TRU elements buried prior to 1970 (pre-70) should be focused on a dedicated, specific TPA milestone. DOE’s baselines should include consideration of retrieving these TRU elements.

SESSION 2 – LANDFILL DESCRIPTIONS/PHYSICAL SETTING

Mike Collins, DOE-RL, introduced Session two. Session 2 is a poster session about the physical description and status of the SWBGs. He oriented participants to what each poster is describing. He said the maps are divided by area and provide statistics on the burial grounds. He said there are pictures of what a typical trench might look like. Susan H. then invited participants to review the posters, and to indicate any questions or concerns by using sticky notes on the posters or on a central poster bin.

Synthesis and panel response to questions/comments

Susan H. reconvened the group. TPA Agency representatives formed a panel to respond to questions as Susan H read them from a synthesis of the sticky notes::

- **Question:** “Difficult to judge/weigh relative risks of different burial grounds. Is there a way to indicate relative risk, or do we not know?”
Answer: Doug Hildebrand, DOE-RL, said there are controls, but further characterization will disclose risk. Briant Charbonneau, DOE-RL, said there are different waste streams and waste was packaged differently. Risk can be associated with this information along with process history.
- **Question:** “What characterization will be done to supplement the historical data where few records exist?”
Answer: Doug said there has been some characterization done which has confirmed geophysical and historical records thus far.
- **Question:** “Is there a regulatory pathway to allow a Resource Conservation and Recovery Act (RCRA) Treatment, Storage and Disposal (TSD)”?
Answer: Ron Skinnarland, Ecology, said today there is not a focus on permitting trenches, but this regulatory pathway can be discussed. Briant said CERCLA is the focus for the burial grounds.

- **Question:** “How much of the waste volume is outside of the trenches”?
Answer: Mike Collins said about 200,000 cubic meters of waste is outside the RCRA trenches.
- **Question:** “Where was the hot waste disposed of before 1959”?
Answer: Doug said this waste would have gone to the landfills in operation then. Briant added that some disposal practices were for new release streams.
- **Question:** “Is there any liquid waste in the solid waste landfills”?
Answer: Doug said there has to be an investigation to address this.
- **Question:** “Is there an estimate of the volume of alpha waste, and where is the other 10 percent”?
Answer: Doug said the alpha waste is spread out in the SWBG and that the statistics will be clarified.
- **Question:** “Why is 218-E12 signified as having both types of wastes”?
Answer: Mike Collins said because both types of waste were disposed of at this location.
- **Question:** “What are the gray shapes on the 200 E poster”?
Answer: Doug said orange shapes represent burial grounds, the green areas are the portions that were not used, and the other grey boxes are facilities that existed.
- **Question:** “Are the trenches to scale on the posters”?
Answer: Mike Collins said yes.
- **Question:** “Is there still need for characterization in the 200 Area”?
Answer: Doug said this will be discussed.
- **Question:** “Will 200 East be identified in the permit”?
Answer: Ron said this will be addressed in the TSD discussion. Everything that is a TSD remains a TSD and will be in the permit.
- **Question:** “What is the percentage of chemicals versus radionuclides in the SWBGs”?
Answer: Doug said in session five of the workshop the landfills will be better identified. Some have more chemicals than others. He said DOE is aware of which SWBGs had chemicals disposed. Nick Ceto, DOE-RL, said there needs to be better context with regards to amounts and types of waste. He said this process should be looked at from a risk standpoint.
- Shelley Cimon said there are burial grounds that have been classified and asked how this will be dealt with regarding public involvement. Briant said the SWBGs were classified based on the content. He said the classification issues are due to weapon components being present. The fact that these constituents are there is not classified, but the specific amounts are classified. He said there is clearance for Ecology to evaluate as a third party. Deborah Singleton, Ecology, said Ecology will look at the data and can assure the public that the amounts do not impose a risk to human health.

- Pam Larsen said she was surprised to see there were caissons in the central plateau and asked if there is evidence of leakage. Mike Collins said there is no evidence of leakage from caissons, based on DOE's groundwater monitoring.

SESSION 3 - PROCESS KNOWLEDGE

Doug presented on the process knowledge documentation and recited the amount of information DOE currently has for each landfill. He said there is an electronic database where all the records are accumulated. He said there is generally good information on what was disposed, but there is somewhat limited documentation for the landfills. He said all of the burial grounds and landfills classified as pre-1970 have had field measurements done. He said DOE has some knowledge of the 218-C-9 construction landfills, but not much on the other construction landfills.

Doug said the SWBGs began operations in 1944 and the years of operation for each facility are noted. He discussed waste containers disposed of in landfills and said there were design considerations and specifications beginning in the mid-1960s. He said the primary purpose of passive waste containers were to keep the waste in and let the heat out. These containers were designed for a long life to prevent release of radioactive material. He said cardboard boxes were discontinued in 1984. The interior void space in the containers was limited to 20% in 1985 and then reduced to 10% 1990. He said some of the void spaces were as high as 50%, which is why there was subsidence.

Doug said a wide range of disposal containers have been used as waste containers in landfills. He said bags, boxes, cylinders, ion exchange columns, and drums were all used as disposal containers. He presented a diagram of the volume of waste buried in each landfill and said the color coding corresponds to the location of where the large volume disposals occurred. He said there was approximately 40,000 cubic meters of pre-1970 waste disposed and showed a graphic of where this waste is distributed in burial grounds.

Doug said there was an economic value to Pu, and there was a strategy behind its retention. He said the 232-Z incinerator came on-line around 1960, and Pu was recovered from the incinerated waste that ranged from a few grams to 250 grams per box. He said there were less than 150 boxes of Pu contaminated material in storage as of March 1959. He said there were some boxes sent for burial before the incinerator was constructed that disintegrated and created a storage and fire hazard. He then showed a chart of the estimated Pu and Uranium mass in landfills, pre-1970.

Question and Answer/Discussion

- Ken Niles asked what was done about design considerations of packaging waste. Mike Collins said it depended on the radioactive levels of the particular waste, the size and shape of the waste, and the high heat loads.
- Susan L. said she assumes the process knowledge is used for characterization and asked if there is a threshold that regulates the amount of characterization required, or a driver aside from public value. Doug said DOE needs to assess what is present in the burial grounds. There were geophysical surveys done to gain some

of this knowledge. He said DOE is using different techniques to signify what classes of waste are present and it will be difficult.

- Susan L. asked about the void space and if this includes the inside of items within containers. Mike Collins said yes, this is all calculated.
- Nick said there has to be enough characterization done for DOE to make an informed decision. He said DOE will look at the information they have and decide if there is enough known to make a cleanup decision or if more characterization is needed.
- Liz Mattson asked if any sites use an uncertainty rating system. Doug said based on the historical records, DOE has information on the types of waste. Briant said DOE does know when trenches were opened and the types of operations that happened. Doug said there are declassified documents which discuss volumes of waste and DOE could look into using these to help fill in the blanks. Liz said it seems a system would be helpful to understand the level of certainty.
- Liz asked how volume estimates are made for the landfills. Mike said the records are fairly good, but the chemical constituent information is not as good because the contaminants of concern were not tracked.
- Liz asked how the records on waste volumes were calculated. Briant said the rough calculations can be made with basic math; however, physical descriptions of items in a particular landfill will not necessarily affect the threat.
- Liz asked what the geophysical surveys are. Briant said this is the use of ground penetrating radar.
- Liz asked how much information constitutes a “record.” Doug said that a record means there is known information in the database, but the amount of information varies.
- Liz asked if there is any on-the-ground evidence regarding types of containers. Doug said most of the containers are labeled and show radiation levels. Briant said the waste disposal container shows the associated risk of disposal.
- Liz asked how DOE knew there was left over Pu in the burial grounds. Doug said there was instrumentation used to find the Pu.
- Ken said there are four landfills with waste disposed of near the 1970 date and asked how these landfills are categorized. Mike Collins said it depends on if they are TSD units. He said many of the containers are being classified as mixed Low Level Waste (LLW). Briant said there is classification happening concurrently with retrieval.
- Ken asked if there are certain trenches identified as higher risk than others. Deborah said Ecology has looked at the data, and there are four trenches with high levels of Pu. Dennis said it is important to analyze what generated the waste, and there is fairly good disposal history regarding the characterization of waste. Briant said DOE is addressing the threat with human exposure scenarios, plant

exposure, and groundwater. He said threats can be calculated with historical information.

- Shelley asked if there is a sense of how many “abnormal” events happened. Doug said there are 54 of these types of events that were documented. Shelley asked if there was a sense of how many were not documented. Doug said there were some larger events that happened, but not necessarily in the burial grounds. He said DOE will review the unclassified documents because if something happened, it was documented in some way. Briant said there were not many events that created solid waste. He said some of these potential events might have occurred when a piece of equipment failed and was thrown away, but would not cause a large threat because it would be surface contamination. He added that there will not be a groundwater threat from these instances.
- Shelley asked how serious the contaminant thorium is. Doug said it is a contaminant of concern that needs to be looked at.
- Tom Carpenter said in July there was an article in the New York Times on the amount of Pu disposed that said the figures published by DOE were lower than the actual amount on the Hanford site. He said the article states that there are four tons of Pu disposed of into soils and asked if the figures have been updated. Briant said DOE has done a lot of investigation as a result of this report. There is agreement on the SWBGs, and the investigation regarding Pu in the other areas is ongoing. Doug said the numbers in the SWBGs are consistent and the total number is correct.
- Pam asked if the labels on boxes and barrels determining waste types have deteriorated. Briant said the labels were meant for transport, and the low risk waste containers probably have deteriorated.
- Mike Korenko suggested structuring characterization to address the immediate risk to workers. He said the workers used an Integrated Safety Management System and safeguard risks have not been addressed, especially with RTD. He added that the information for workers should be made clear. Briant said there is a methodical process using CERCLA for determining the threats to workers. He clarified that while the risks are being determined, it is assumed that there is risk to workers and the worst case is always assumed with retrieval.
- Gerry Pollet said air monitors reveal if there are chemical risks in the burial grounds. He said the chemical contamination needs to be considered and discussed. Briant said DOE has taken precautions for chemical contamination and utilizes confined spaces to trap vapors along with extraction systems to minimize worker exposure.
- Gerry asked about the levels of chemical constituents found with the vapor risers. He said this should be discussed for characterization purposes when low concentrations can be very harmful to workers. Doug said an analytical technique will be used for organic material and vapor samples as a part of analyzing risks. Susan L. said the chemicals issue is addressed in past HAB advice.

- Dick Smith said that there is a discrepancy in the calculations of cumulative Pu.

Presentation on the Idaho National Laboratory

Dennis presented on buried radioactive waste at the Idaho National Laboratory (INL). He said INL is located near Idaho Falls at about 5,000 feet above sea level. This was a 97 acre site with waste from Idaho and the Rocky Flats operations. He showed a picture of waste being disposed and said the amount of water that got in the drums determined how deteriorated the containers were. He showed a picture of the disposal area 35 and said the remedial investigation was broken into four areas. The waste zone had 300 probes throughout the burial grounds and boreholes were used in the vadose zone as a means of investigating what is reaching groundwater. He said wells were used to detect contamination in the aquifer. The information collected was used for the risk assessment and to look at the contaminants of concern. He said the EPA worked on the cleanup in the 1990's by conducting in situ grouting of Beryllium, glove box excavation methods, and other accelerated retrieval project. He said there were attempts to do visual identification of waste at the Idaho site.

Dennis said many lessons have been learned at INL. He said there were a lot of organics taken out of the waste stream, which is how the aquifer was protected. He said it is a balance of different alternatives and choosing technologies based on waste streams. He said when the Idaho site waste retrieval was targeted, there was in situ grouting of waste types, vadoze zone vapor vacuum extraction and treatment, evapotranspiration surface barriers, and long term monitoring. He then showed pictures of facilities and examples of waste packaging on the Idaho site. He said to keep goals in mind and to view cleanup from a remedy standpoint. He reminded everyone that there is a lot of material and that the information on the SWBGs will be shared with the public. He asked if the participants felt this information on INL would be useful to include in the public workshops. The group indicated this would be useful.

- Ken asked if there are relevant lessons that can be applied and if there are any waste streams that can be retrieved at Hanford. Dennis said there are lessons learned and that there is potential for retrieving waste streams.

SESSION 4 – ENVIRONMENTAL MONITORING

Doug said the fourth session is to address environmental monitoring and said that the posters provide the information available thus far. Susan H. then invited participants to review the posters, and to indicate any questions or concerns by using sticky notes on the posters or on a central poster bin.

Synthesis and panel response to questions/comments

Susan H. reconvened the group. TPA Agency representatives formed a panel to respond to questions as Susan H read them from a synthesis of the sticky notes:

- **Question:** “What will the impact be on Black Hawk Reservoir with drying wells and groundwater on site”?

- Answer:** Dib Goswami, Ecology, said Ecology reviewed three documents and the Black Hawk Reservoir EIS studies that looked at the impacts to Hanford. He said the study showed that the Black Hawk Reservoir will adversely affect the 200 Area at Hanford and that there would be significant impacts from water coming to Hanford, which was mentioned in the TC&WM EIS. Doug said there is an increase of three meters allowed within operating standards of the water table.
- **Question:** “What does “adequately” mean with regards to groundwater monitoring”?
Answer: Stuart Luttrell, CH2M Hill Plateau Remediation Company (CHPRC), said “adequately” means that Ecology has been consulted on a groundwater network and if a well goes dry it is replaced. Dib said data gaps are identified through a rigorous process. He said there is a need for more information on the sub-surface geology and the monitoring wells are no longer valid because there is no groundwater. Currently, different options are being investigated for monitoring the facilities.
 - **Question:** “Why does W-3 in the 200 West Area only have three wells and are these wells compliant”?
Answer: Stuart said W-3 has five wells, and there is a milestone process to assess the need for more wells. He said the current wells are compliant, but there are some wells that are not. There is a decommissioning process for these. Briant said wells that have not been sealed are not compliant, but are still useable. However, it is understood that there is a threat.
 - Gerry said the impression is that the wells are RCRA compliant but not located where they are supposed to be. Briant said the TPA agreed to the current well network. Gerry said there are lessons learned when contaminants are still not meeting standards. Dib said these well issues will be looked at in a robust way which will affect many facilities. Relative to the monitoring networks, he said Ecology will work to make them more extensive.

SESSION 5A – POST-1970 WASTE

Doug said session five will go into more detail on the waste. He said he will discuss the difference between post and pre-70 waste. He said there is a considerable volume of information that has been collected on these landfills, and the current version of the 200-SW-2 work plan contains an extensive discussion of this information.

Doug went over the post-70 land landfill categories and discussed the general features of each. He then provided a chart that showed the years of operation of each landfill.

Doug said on March 20, 1970 the United States Atomic Energy Commission issued an Immediate Action Directive regarding solid waste burial after April 30, 1970. He said the directive implemented recommendations on costing, segregation and irretrievability of waste. The directive called for wastes with contamination of transuranic nuclides (TRU waste) to be segregated, packaged and buried in as low-level waste (LLW). He said the segregation, storage and retrieval of TRU waste will not be a part of the 200-SW-2 RI/FS remedy selection process.

Doug discussed the lessons learned from the post-70 landfill excavation to date. He said typically the more recent the material was placed, the more intact it is. He said there are different types of containers ranging from small boxes to large 40-ton monoliths, and the integrity is variable based on the container materials used. He said area contamination to date ranges from none to only within the immediate proximity of the container. Earlier this year a release required modifications to be made to monitoring. He said production has been less than anticipated due to weather, as well as excessive levels of radon.

Doug said the post-70 landfills include the eight TSD landfills included in the Hanford facility dangerous waste permit. He showed a chart of the number of records and the approximate waste volumes DOE has for each post-70 TSD unit landfill.

Doug then provided a general description of some of the post-70 TSD landfills and discussed the characterization that has taken place.

Wade Riggsbee, HAB Issue Manager, said he was asked to examine the issues surrounding solid waste and develop some discussion points. He said there have been issues with completeness of the inventory, including laboratory chemistry and off-site waste. He said the amount of current and planned characterization should be discussed along with the condition of the material in the trenches with considerations for treatment. He said there has been a problem with calling these "landfills," as some of their characteristics (e.g. unlined trenches) are inconsistent with the way landfills are defined by the Washington Administrative Code.. He said there should be a regulatory path forward. He said the Solid Waste EIS found that leaving waste in place would create future problems, but he has not seen these issues addressed yet. He said a primer on solid waste would be useful as the process evolves with terms and options for moving forward.

Question and Answer/Discussion

- Bob Suyama asked for better clarification on the difference between post-70 and pre-70 waste and how it is classified. Doug said some of the trenches might have been opened in 1965, and there are portions of these trenches that were dealt with under milestone M-19 and the rest are addressed with SW-2. Mike Collins said there are records showing what trenches have retrievable waste so DOE knew to go after this waste.
- Ken said some waste was intended to be retrieved and some was intended to be buried in place. Matt said before the RCRA act was passed there were less restrictions and the disposal was different. In 1970 there were land disposal descriptions and RCRA did not apply to what was previously buried.
- Ken asked, since 218-W-3A was opened from 1970, how many TSD landfills have stored waste. Mike Collins said 4 landfills have stored waste.
- Ken asked how many records exist for onsite and offsite waste. Mike Collins said the records are generally good.
- Gerry asked why there is not one continuous burial ground unit. He said the waste management areas are divided instead of being clumped into one unit for monitoring. Matt said there is separation due to how the records and operations are historically organized. In terms of CERCLA, the burial grounds are treated as

one big unit. Deborah said Ecology knows all the areas are under the permit and the burial grounds are identified as used and un-used in the permit. Nick said this division is just for the purpose of presenting the information.

- Jean Vanni said these landfills are RCRA TSDs. When cleaning them up, it does not matter if the waste is pre-70 or post-70 waste, they are still subject to the Model Toxics Control Act (MTCA) standards. She said it is hard to understand if CERCLA or RCRA is going to provide the best cleanup and more discussion on this is needed.

SESSION 5B – PRE-1970 WASTE

Doug said pre-70 landfills are categorized as industrial landfills, dry waste alpha landfills, dry waste landfills, and construction landfills. He then presented the data DOE has on volumes and level of record for each pre- 70 landfill and said there is a limited amount of information.

Doug provided examples and general description of industrial, dry waste, alpha waste, and construction landfills and discussed some of the characterization that has taken place.

Doug said that there are 21 dry waste trenches oriented east to west and eight vertical pipe unit style caissons. He said this is part of the M-91 retrieval and showed pictures of where the caissons are located.

Question and Answer/Discussion

- Shelley asked if there is any waste that does not have a record showing where it was disposed. Mike Collins said records are incomplete when it comes to waste disposed before 1970.
- Jeff Luke asked about the inventory information for the sink hole from subsidence. Wade said probes were used to push a periscope into the sink hole and there was a series of studies on compaction.
- Jeff asked what the term “metallic waste” meant. Doug said the term is referring to metal drums and boxes. Mike Collins said there has to be significant metal for it to be detected with instrumentation.
- Ken asked that, given the amount of data is small, how is it determined that there is alpha rather than dry waste in a particular trench? Doug said this determination is based on the naming schemes in the 1940s and 1950s so there is most likely alpha waste in some dry waste landfills.
- Wade said many of the topics that he raised in his early issue manager comments apply to both pre-70 and post-70 waste, and some of the emerging documents might provide further insight.
- Susan L. asked if it was true that there could be waste buried in 1969 next to waste buried in 1970, both being equal risk, but only one will go to WIPP. Matt said that is almost correct and said if the waste is TRU waste it will go to WIPP. He said the pre-70 waste does have a risk evaluation. They look at the quantity

and what the risks are. John Price, Ecology, said August 1987 is the date RCRA was started which is important to consider. Dick said basing how waste is dealt with on dates does not seem right.

- Jeff asked if the risk is calculated based on quantity of waste or its ratio to the mass of all the waste present. Matt said the goal is to have a common understanding of the risk of materials. There are different methods used for different constituents.
- Jeff asked if there is a guideline for the amount and types of waste that determines where it is disposed. Matt said the amount of waste depends on if it goes to ERDF and or WIPP.
- Tom asked about the cesium being close to the surface in 218-E-2 and how this was determined. Doug said when some of the boxes were hauled away cesium was disbursed, so the area was hosed down with water from fire trucks.
- Tom asked why the conventional unit curie measurement is being used for Beta Gamma. Doug said this terminology relates to how mixed fission products are defined. Curtis Stroup, CHPRC, said the worry was about dose. In the 1970s DOE measured quantities of cesium, which has gone through two half lives by now. Tom said he thinks of doses in different measurements, such as millirem.
- Liz asked how it was determined that 218-C-9 was only LLW. Doug said this determination is based on the records. He said there was not any Pu disposed, and less than a milligram of Uranium disposed, in a specific area in 218-C-9.
- Gerry said regulatory processes around the SWBGs should be considered. He said it is important to know how many floods or fire events, including deliberate burnings, there were. Briant said there has since been work to make sure that situations such as rapid snow melt are not an issue. Gerry said this raises questions on how the burial grounds are characterized. Matt asked if it would be helpful to have a report or a list of events that could have affected the burial grounds. He said DOE will generate this.
- Jean asked if the caissons are a part of M-91. Mike Collins said there are certain caissons that are in M-91 and the rest are in SW-2 Operable Unit.
- Maynard Plahuta said the dry waste and the dry alpha burial grounds should be lumped together to make is more simple for the public.
- Maynard asked if the building known as the “farm house” has been cleaned up. John said it was a critical mass lab and it was an Ecology lead. He will get more information on this building if it is wanted.

SESSION 6 – REGULATORY DECISION PROCESS

Nick Ceto said there will be a SWBG work plan, corrective action and a public review. He said not all Hanford waste went into burial grounds; some went to tanks, cribs, ponds and trenches. He said there were places at Hanford to take liquid waste and there was never the intention to put liquid waste in the SWBGs.

Nick said DOE is preparing the RI/FS report, which will lead to a proposed plan. He said the RI/FS report will provide the foundation and DOE will have to know the nature and extent of contamination from release. DOE will analyze the technologies that may be applicable, develop alternatives and use this information to do a comparative analysis.

Nick said that DOE does not know all the information on what went into the SWBGs, but does know what did not go into the SWBGs. He said the geological surveys help confirm the historical information. He said the groundwater monitoring results do not indicate that the LLW burial grounds have contributed to the groundwater contamination. He said DOE needs to develop more data for remediation alternatives.

Nick said there needs to be enough information to make a decision on how to mitigate. He said there are no regulatory gaps; DOE has the authority under CERCLA and RCRA to address whatever has come from the landfills.

Nick said in the RI/FS process DOE will remove everything in the landfills and look at the most mobile material. He said DOE will look at places where treatment, such as grouting, can be done. He said DOE will look at containments and all the alternatives in order to make intelligent recommendations for deployment.

Nick said there are things that can be learned from the EPA and other sites and States. He said additional characterization has to be done, which will be discussed between the agencies and be open for public comment. He said this is an iterative process and reminded everyone to keep in mind that these are landfills and that the risks are being looked at. He then showed the decision process schedule.

Deborah Singleton said there are 600 acres being covered and there is a lot of information. She said there is a TPA commitment, CERCLA requirements with closure and sample analysis plans and an RI/FS, and RCRA/CERCLA integration. She said inside the burial grounds there are “green islands” that have mixed waste. She said Ecology looks at the SWBGs from a risk-based perspective.

Deborah said the commitments are for the revision of the work plan to be turned in on December 31, 2011 and to complete the RI/FS Process by December 31, 2016. She said there are active landfills and inactive landfills. She said the active landfills include trench 31 and 34, trench 94, and trenches never used. She said inactive landfills received dangerous and radioactive waste after 1987.

Deborah said this process will depend on the laws and regulations that apply. She said the TSD units are identified in the permit and the decisions will be made under CERCLA. She said there will also be corrective action in addition to the administrative code. She said the biggest task is to find out what characterization is needed, and Ecology wants input from the HAB on their concerns.

Question and Answer/Discussion

- Shelley said there needs to be an architecture that shows the stages of the decision process. She said she has never heard of the green islands concept. Doug said he acknowledged green islands in his presentation and said it is where there is mixed waste. Deborah said the green islands are important to consider with the RCRA

and CERCLA integration. Nick said the protocol would be to start scoping the RI/FS and discuss it with the HAB, which is the beginning of the process.

- Dick asked what is meant by no particular detection of groundwater being affected. Nick said there is no clear documentation that there have been any releases into the groundwater. Dick said if leaving the waste in place is a consideration, there should be characterization. Nick agreed.
- Dick asked what the decision process is for when a source is important enough to remove. Deborah said this will be a part of the RI/FS process. Dick said there needs to be criteria.
- Gerry said there is a lot of information on waste disposed outside the burial grounds and asked how only small areas are designated as mixed waste islands.
- Gerry said he is unclear if an integrated approach is a better way to look at the SWBGs. Ron Skinnerland, Ecology, said it makes sense to integrate all the requirements. Ron said it is more important to integrate requirements and move forward with cleanup rather than spending time on the size of green islands. DOE wants to do an analysis based on a set of contaminants, and the goal is to do a protective cleanup. Ron said DOE will need to satisfy all the requirements in this process.
- Gerry said sometimes the word landfill is used and asked what the difference is between a landfill and a trench under EPA's guidelines. He said the State law says you cannot use a presumptive remedy for a landfill. Nick said DOE is not suggesting that a presumptive remedy is correct.
- Mike Korenko said technical solutions from other industries (e.g. mining) seem to be underutilized, particularly with applications for the vadose zone. Briant said DOE has used horizontal drilling and is evaluating this for the deep vadose zone and for other future potential use.
- Jeff said it is important to look at these concerns from a larger scale regulatory process. He asked if there should be a session in a committee to look at the regulatory process for the Hanford site.
- John said the date for the work plan is quite a ways off. Advice given in February will still influence the work plan. Nick said there will be an annotated outline of the work plan for the HAB to view.

SOUNDING BOARD – HAB PERSPECTIVES

Consistent with the “sounding board” process, Susan H. went around the table and invited HAB members in turn to make a statement in response to “*Given the information you have received today, what are your areas of interest for the agencies to consider going forward?*”

- Tom said he was surprised by Dennis's presentation on how long it took to reach an RI/FS at Idaho. He said uncertainty is worth looking at and embracing. He said

at Hanford it is hard to know everything and some things may never be known. He said we should not jump to solutions without information. He said it is paramount that Hanford does rigorous characterization on the risk areas. He said it is important to know what characterization looks like and to determine when we are comfortable saying something is clean. He said the half life of constituents should be considered. He said what was heard today is the very beginning, and there should be deep inquiry before making assumptions.

- Maynard said the vadose zone is the key for the burial grounds. He said drilling a bunch of wells does not make sense, and he thinks horizontal boring should be considered. He said there can be a lot of characterization, but we may never know everything. However the vadose zone is the most important aspect.
- Dick said it is more important to do a near surface vadose zone evaluation at this point. He said he has a hard time talking about the RCRA and CERCLA rules, or the date waste was buried. He said protecting groundwater is what should be the most important.
- Bob said he appreciates the TPA getting the HAB involved early in the process. He said a focus area of his is long term stewardship. The decisions made now with regards to trenches and landfills are going to impact maintenance for the long term. He said we have to focus on making sure that what is in the ground is safe.
- Mike Korenko said the graphics for the poster sessions were great. He said there is confidence with the logistical jargon, and he suggests sticking with discussing risk. He wants to hear a discussion on risk instead of hearing RCRA and CERCLA being discussed. He believes there should be a definition of risk.
- Lyle Smith said he would be interested in looking 10-30 feet below the trenches and how it could impact the river.
- Dan Serres said a three dimensional image of what is going on might be more helpful. He said there should be a rigorous characterization process. He said where the HAB stands in the process is important to portray to the public. Regarding chemical waste, he said if it is not known what chemicals are in the ground it will be difficult to understand the process. He said leaving waste leaves risk. He said it will be difficult for the public to understand leaving waste on site.
- Gerry said he was hoping there would be a larger range of ideas and documentation on the burial grounds at the workshop. He said there was only one viewpoint and for years there has been monitoring and looking at information on mixed waste buried in other places. He said Dick Hagen spent time to prepare a presentation for today's workshop, and Gerry said he has this information if anyone wants to look at it. He said today's presentation has information on levels of Uranium but there is disconnect with risk assessments. He said considering the lack on information on the SWBGs, the characterization may take a long time and they could potentially be excavated by the time this is finished. He said the issue is whether the SWBGs are capped or not. He said CERCLA and RCRA have different monitoring requirements, and Heart of America Northwest has wanted

monitoring for 15 years. He said the most important thing is that no groundwater is being impacted; the soil gas levels are high and dangerous and could be spreading and impacting groundwater. He said there has not been characterization but it is known that there are other unlined ditches that have had releases and there are a lot of lessons learned. He said Uranium alone is estimated to have a 25 millirem dose from two miles away, which is a sobering consideration.

- Sam Dechter said focusing on the risk is good, but someone might slip and confuse the public with CERCLA/RCRA jargon. He said there should be a presentation that simplifies timelines and codes so a person coming in can understand the focus and argument of risk. He said it would be worth some effort. He said an investigative action would be useful to generate information on why it takes so long to accomplish things. He said he has seen the burial grounds and knows where they are, but there should be some key markers or roads on the posters and graphics to gain perspective.
- Steve Hudson said the term “characterization” has been used many times and is effective. He said characterization drives the cleanup decision, and he does not know how characterization is driving this one. He said from a public involvement point of view, showing how this interrelates is important.
- Ken thanked the TPA for the COTW workshop. He said he is concerned that the discussion starts with an all or nothing premise, and thinks there are lessons learned from the Idaho site. He said there is lack of characterization, which is needed to know where the risk is; the solution might be a combination of targeted retrieval, vadose zone, and others actions and then some of it may be capped. He said finding the high risk areas should be the priority. He said he is disappointed that there was not a Frequently Asked Questions document available before this COTW, that it would have been really helpful, and he hopes the TPA can find agreement to have this for the public workshops.
- Dale Engstrom said the TPA has done a good job on the workshop and he liked the poster approach. He said this was supposed to be an educational workshop and there are more workshops coming. He said it is amazing that there is so little knowledge on what is in the trenches. The burial grounds need to be looked at to isolate areas where waste can be removed. He said one of the aspects of this approach is that it is a cumulative effect. This is one more area that should be considered for affecting the vadose zone. He said the HAB encourages RTD and the burial grounds would be a fairly easy place to do this.
- Shelley said maybe RTD needs to be looked at more seriously. She said she liked the posters, but there should be an overall map orienting people. She said she appreciates that Matt McCormick is here. She said it is important that the HAB is a part of these discussions. She said Matt offered a document to synthesize all of the incidents to have a common understanding of what went on. She gave a reminder that when terms are changed they should be shared (e.g. “green islands”).

- Liz Mattson said she appreciates the comments, the work that went into this workshop and the number of support people to answer questions. She said it is unsettling looking at the timeline and how many people in this room will no longer be involved when the final decisions are made. She said she hopes these ideas can be integrated and not disappear.

Sounding Board, Round 2 (offered to those with additional comments)

- Tom said getting Pu in your lungs is a big deal, and he asked if there is confidence that it will stay where it is put.
- Maynard said he hopes decisions are made that are not irreversible.
- Dick said for the graphics it would be helpful to have legends to describe the colors. He said there was a lot of discussion about records, but not on what comprised a record and how much information they have.
- Bob said for the public meetings there should be a tutorial on pre-70 and post-70 waste and 1987 waste. He said there is no logic, and it would be helpful to describe this process better to the public.
- Mike Korenko said there is a lot of money spent on technology for tank vapors to see what is present. He said maybe these vapor technologies could be used on the trenches. He said going forward it would be helpful to have a project management plan with a resource schedule, and it could include what factors might change the schedule.
- Shelley said the public needs a primer on dose and what it is: high dose, remote handled, TRU waste, and disintegrations. She said we should be on the same page on talking about amounts as well.

NEXT STEPS/CLOSING REMARKS

Nick said this workshop is why he appreciates the HAB. Advice has to be well informed.

Matt said he would like to thank everyone who put this together to provide a better understanding of the challenge ahead.

Deborah said thank you and said this will be difficult, but the HAB input is imperative.

Briant said he has heard a lot of the sounding boards and it energizes DOE to do better.

Susan Leckband thanked everyone for coming. She reminded everyone of when the HAB started the flowchart and how long it took. Work on the SWBGs will take a long time as well. She said the HAB has the opportunity to influence the proposed plan. She said not everything has to be in the first advice, but it can be built on values.

FOLLOW-UP

- Is 218/291-C-1 part of this operable unit? If not, where does it belong? (from Appendix S of the TC&WM EIS)

- Why “break up” burial grounds (e.g. RCRA units)?
 - Regulatory path and contiguous units
- TSD and RCRA
- Follow up session with HAB: Cleanup under CERCLA pre/post 1970 and RCRA
- Need architecture/criteria/timeline for HAB work with agencies
- Need further discussion of “green islands” (how reliable is data to designate these green areas?)
- “If there was waste disposed after 1987, should we do something different with it?”
- RCRA – Landfill vs. trench – Does this fit? State law applicability?
- Potential for advice in February?

Handouts

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

- An Introduction to Hanford’s Radioactive Solid Waste Burial Grounds, TPA, October 5, 2010.
- Hanford Advisory Board – Central Plateau Remediation Action Values Flow Chart
- Overview of pertinent HAB Advice, Susan Leckband, October 5, 2010.

Attendees

HAB Members and Alternates

Tom Carpenter	Mike Korenko	Gerry Pollet
Shelley Cimon	Pam Larsen	Wade Riggsbee
Sam Dechter	Susan Leckband	Dick Smith
Dale Engstrom	Liz Mattson	Lyle Smith
Laura Hanses	Ken Niles	Margery Swint
Harold Heacock	Jerry Peltier	Bob Suyama
Steve Hudson	Maynard Plahuta	Jean Vanni

Others

Paula Call, DOE-RL	Joanette Biebesheimer	Marve Hyman, Bechtel
Nick Ceto, DOE-RL	Dieter Bohrmann, Ecology	Stuart Luttrell, CHPRC
Bryan Foley, DOE-RL	Madeleine Brown, Ecology	Dale McKenney, CHPRC
Doug Hildebrand, DOE-RL	Elis Eberlein, Ecology	Sonya Johnson, CHPRC
Rich Holten, DOE-RL	Dib Goswami, Ecology	Curtis Stroup, CHPRC
	Jane Hedges, Ecology	J & M (Titto) Moses, CTUIR
	Asopuru Okemgbo, Ecology	Ted Repasky, CTUIR
	John Price, Ecology	Susan Hayman, EnviroIssues

	Deborah Singleton, Ecology	Blair Scott, EnviroIssues
	Ron Skinnarland, Ecology	Stephanie Johansen, ETMEC
	Laura Buelow, EPA	Barb Wise, MSA
	Emy Laija, EPA	Sharon Braswell, MSA
	Dennis Faulk, EPA	Lisa Strakae, Navarro
		David Bernhard, Nez Perce Tribe
		Michele Berber, URS
		Joe Bartoszer, USFWS

Attachment 1: Transcribed “Sticky” Notes

General

- Note: Better identification of buildings and other features to ease in locating oneself would be helpful.
- What is percentage of chemicals vs. radionuclides (all sites)?
- What is make-up of waste – pre vs. post 1970 (all buried waste sites)?

Session 2

- Difficult to judge/weigh relative risks of different burial grounds. Is there a way to indicate relative risk, or do we not know?
- What characterization will be done to supplement the historical data where few records exist?
- Please identify some buildings on the posters so we have a better sense of where they are

Session 3

- Do old pond sites which now have trenches on them demand exhumation?
- Total volume estimates of Pu, U, Cesium and Thorium 232?
- Concern with analogous site approach. Off-norm processing events and we have no records?
- What triggers the need for further characterization?
- In the process of building decision criteria, will we have multiple opportunities to collaborate?

Landfill Design and Configuration

- What characterization is being done under trenches? Monitoring of groundwater>

Volume of Waste Buried by Landfill

- Show just the waste volumes subject to the SW-2 decision process

Volume of Waste Buried by Landfill Pre-1970

- A map like this showing Pu (for example) distribution would be very useful

200 West Radioactive Solid Waste Landfills

- What RCRA trenches will remain as RCRA TSDs?
- Put lines from map to pictures

200 East Radioactive Solid Waste Landfills

- What are the gray shapes?
- What do the orange colors mean?
- Are trenches shadows to scale?
- If records are not good for chemical contaminants, what work is planned for characterization?
- Will 218-E-10 remain on the RCRA permit low level burial grounds?
- Roads and major structures would help orient the observer
- Relate sizes and volumes to something the public can understand
- Why is 218-E-12 listed as both Alpha and Construction Waste Landfill?

Other Landfills — Outside of 200-SW-2

- How much soil is on top of the sites?

TSD Unit Landfills

- How can changes be made to a TSD boundary?
- How will public involvement occur for these changes to a CERCLA SAP?
- Will changes to these SAP and Work Plan be done during [unknown word] manager meetings?
- If already incorporated by reference into the RCRA permit via the TPA, why remove them from the RCRA permit to put them into the TPA under CERCLA?
- What is the regulatory pathway citation that allows changing of the boundary of a RCRA TSD?
- How much of this 70% of waste volume is outside of the RCRA trenches 31, 34 and the reactor trench?

Construction Landfills

- Where will soil come from to cap?
- Any RCRA dangerous wastes disposed in these landfills?

Dry Waste Alpha Landfills

- Need to consider choices between adequate characterization and just proceeding with RTD
- Where's the other 10% of pre-1970 alpha inventory located?

Caissons

- Caissons were open at the bottom. Might want to note this
- Where was hot cell waste disposed of before 1959?
- Are the caissons currently subject to the RCRA permit?

Landfill Surveillance and Monitoring

- This is good example of how geophysics or other characterization could be used to identify parts of trenches that need more attention

Hanford Low-Level Burial Grounds - Groundwater Monitoring

- Listing regulations by its numeric title says nothing about what is actually required. For public consumption, a simplified listing of the actual actions needed would be much more instructive.
- How often are plumes updated (mapping of plumes)?

200 West Current Groundwater Monitoring Network

- For public consumption, it would be helpful to describe the actual monitoring process: How are samples drawn? Are the samples drawn differently for different contaminants?
- These are not all RCRA compliant, nor monitored quarterly

200 East Current Groundwater Monitoring Network

- Red (TC) vs. Red (TCE) – is not clear here
- What does 'adequately' mean (for groundwater monitoring)?

Other Landfills — Outside of 200-SW-2

- How much soil is on top of the sites?

200 West Active Landfill Groundwater Monitoring Networks

- Why do W-3, W-3AE (with 13 trenches and 12 caissons) have just 3 wells? How is that compliant?
- Are these wells all compliant and will remain so (e.g. reaching groundwater as designed)?
- W-3AE has 13 trenches and 12 caissons. Where is the early/vadose zone monitoring as required by RCRA/HWMA, and are 3 wells compliant?

Hanford Waste Disposal Pathways

- Is “low activity” an actual legal term?
- Is there solid waste in cribs and ponds?