

FINAL MEETING SUMMARY

HANFORD ADVISORY BOARD

COMMITTEE OF THE WHOLE

December 16, 2009

Richland, WA

Topics in this Meeting Summary

Welcome and Introductions 1

“Unrestricted Use” compared to “Unrestricted Surface Use” 1

Groundwater cleanup – “Highest Beneficial Use” Compared to “Intended Use” 4

150-year Timeline 5

DOE Radiological Ecological Protection Standard 6

Use of Institutional Controls and Long Term Stewardship in lieu of Remove, Treat and Dispose (RTD) 7

Integration of DOE’s Trust Responsibility in Decision-making 10

DOE’s Use of Modeling versus More Characterization 12

Recap and Framing of the Afternoon Discussion 13

Bin (*as captured on flip chart notes.*) 23

Handouts 23

Attendees 24

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.

Welcome and Introductions

Susan Hayman welcomed the committee and introductions were made. She explained that there are seven topics with two iterations of each topic. The topics will be framed by one of the Hanford Advisory Board (HAB or Board) issue managers, followed by a brief response by a representative of one of the Tri-Party Agencies. The agency response will then be followed by a period of clarifying discussion and issue/concern identification by the HAB.

Topic 1: “Unrestricted Use” compared to “Unrestricted Surface Use”

Dale Engstrom provided the Issue Manager comments. He said the HAB is concerned with the perceived change in cleanup standards from “unrestricted use” to “unrestricted surface use.” The HAB has consistently said that the end result of cleanup should be unrestricted use of the land. There is concern that unrestricted surface use excludes the subsurface from further or extensive cleanup. He asked for the basis for using “unrestricted surface use” versus “unrestricted use.”

Dennis Faulk, U.S. Environmental Protection Agency (EPA), provided the agency response. He said that under an “unrestricted” level of access, the remaining

contamination does not preclude any human uses. He reminded the HAB that the term “unrestricted surface use” is derived from HAB Advice #23 (Current Tri-Party Planning for 100 Area Cleanup, May 1995). In that advice, the HAB said “Fully unrestricted surface use means that full-time access to the surface, and to a depth of 15 feet below the normal surface elevation, is assumed without exceeding the specified post-release risk level.”

The first interim action Record of Decision (ROD) issued in the 100 Area in October 1995 stated that “For purposes of this interim action, the remedial action objectives are for unrestricted use.” Dennis emphasized three of these remedial action objectives (RAOs), including: 1) protection of human and ecological receptors from exposure to contaminants; 2) controlling sources of groundwater contamination; and 3) return soil concentration to a level that allows for unlimited future use and exposure. He said that chromium is the main contaminant of concern in this area at this time.

Dennis explained that the “balancing factors concept” introduced in this ROD states that sites with engineered structures that extend beyond 15 feet in depth will be remediated to RAOs at a minimum. The identification of 15 feet as a threshold comes from the Model Toxics Control Act (MTCA), and was used to describe a depth at which a residential basement would be constructed. Dennis said there are provisions in MTCA to adjust the depth for site specific conditions.

For deep sites where contamination begins at a depth at least 15 feet below the surface, Dennis said several factors will be considered in determining the extent of remediation. He provided examples of situations where contaminated material was removed at a greater depth than 15 feet to address site-specific contamination issues, including 100-B-27 Waste Site, 118-B-1 Borehole, 116-N-1 and 1100-F Retention Basin.

In summary, Dennis said that unrestricted surface use requires cleanup to at least 15 feet below the surface and maybe more, depending on the site-specific circumstances. Nick Ceto, Department of Energy – Richland Operations Office (DOE-RL), emphasized that DOE’s goal is for unrestricted use in practice, regardless of the terminology.

Committee Discussion

- Greg deBruler said unrestricted use means it can be used for anything, and that the average person will see little if any restrictions. He appreciated the clarification.
- Nick said there is groundwater contamination and DOE is going to have to figure out what uses can be accommodated, and will have to manage what to do about the public risk. There will probably be deep contamination and it will last a long time. John Price, Washington State Department of Ecology (Ecology), said he thought the contamination would take 280 years to resolve. Dale said the idea of a deeper cleanup now is a good idea, since the United States hasn’t even been around for 280 years.
- Nick said that the idea is to make those tradeoffs in management. In order to provide unrestricted access to the outer area and along the river corridor, there may need to be other areas with greater management and restrictions. DOE is trying to balance this.

- Gerry Pollet said one of his issues is a perception from DOE and Tri-Party Agreement (TPA) presentations that, based on these RODs, the contamination footprint will be shrinking. Gerry felt this was not accurate and should be discussed further how to clearly present this to the public. The second issue Gerry brought up is that MTCA uses 15 feet as a default for unrestricted surface use, but there are houses with utilities deeper than 15 feet.. As a standard, it is better to examine the likelihood of the exposure being greater and the standard should be inclusive of 15 feet and transport.
- Maynard Plahuta commented that what Gerry said gets back to “when is clean, clean.”
- Shelley Cimon said that her experience at Hanford is that there are instances where DOE “chases the plume.” She asked when this stops and cleanup starts.
- Dick Smith commented on the comparative risk of removing contaminated material versus leaving it on site. Shelley said it has to do with technical feasibility. Dennis responded that the presentation contains relevant information that Dennis didn’t have time to present.
- Barb Harper, Confederated Tribes of the Umatilla Indian Reservation (CTUIR), said her issues relate to multiple pathways and restricted access based on different exposure scenarios.
- Larry Gadbois, EPA, said EPA has translated the contamination from different exposure scenarios for unrestricted surface use and unrestricted use. In each calculation, people are further removed from the contamination. It is important to understand how these values are calculated.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. Looking for total unrestricted use
2. Concern w/projection that exceed our lifetimes/length of current U.S. History
3. Perception that foster misunderstandings (from agency public presentations)
4. How to present to the public?
5. Reality of unrestricted surface use and MTCA
6. Should exposure scenarios be inclusive of scenarios w/ exposures > 15 feet & transport mechanisms?
7. Ties in with “how clean is clean”
8. When do we start/stop w/cleanup?
9. Technical feasibility
10. Multipath way exposure – tied to scenario
11. Translations for USU/UU → cleanup numbers

Topic 2: Groundwater cleanup – “Highest Beneficial Use” Compared to “Intended Use”

Dale provided the Issue Manager comments. He spoke to the issue of “highest beneficial use” and how in some documents “intended use” is used instead. He assumes that these terms are applied to different industrial areas. There was also HAB advice about the usage of these terms with regards to groundwater cleanup.

Nick provided the agency response. He said the “highest beneficial use” as compared to “intended use” is a case of imprecise use of terminology in writing. He thinks, regardless of language, that the intention is the groundwater will be restored to highest beneficial use because that is the expectation under MTCA. He said DOE looks at drinking water standards and risk for groundwater and, in some cases the contamination levels are actually lower than for drinking water standards if there are multiple contaminants. He said DOE looks at groundwater from a consumption standpoint and then from a surface water standpoint when developing standards. He said that groundwater cleanup levels are based on estimates of “highest beneficial use” and the reasonable maximum exposure. Nick said decisions are focused on addressing risk to potential users. He gave an example of how DOE is doing cleanup in the Columbia River beyond drinking water standards due to aquatic protection goals for sites along the Columbia.

Committee Discussion

- Dick asked if DOE considers a combination of all of the standards (human health, ecological, drinking water, etc.) when setting cleanup goals. Nick responded said that there are Maximum Contamination Levels (MCLs) and Maximum Contamination Level Goals (MCLGs); DOE has to make a cleanup goal and understand that there might be multiple contaminants. Shelly asked about the economic components related to this topic. Nick clarified that the economic component is dictated by the MCLs.
- Sandra Lilligren said there are few ambient water quality standards, and there are concerns how will the agencies respond to this. Nick said this is on the radar for DOE and more is being done.

Issues for further discussion

HAB members identified the following issue for further discussion:

1. Few ambient water quality standards established – if they don’t exist, how do agencies respond?

Topic 3: 150-year Timeline

Greg provided the Issue Manager comments. He said there was consensus among attendees at the Exposure Scenario Task Force meetings in 2002 that a 150-year timeline was unrealistic. He asked about using 75 or 50 years instead, and if that would impact cleanup. He said using a 150-year timeframe leaves too much flexibility and doesn't incentivize the agency to complete the cleanup as soon as possible.

John Price provided the agency response. He said Ecology has had two workshops on this issue. He said there is good advice in HAB Advice #132, and the response to the advice refers to the 150-year timeframe. John said there has to be extra consideration if the area is intended to be residential and an evaluation for what would happen if the protections fail. The Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) and MTCA at other sites is also 100 years; what Ecology is doing is consistent with that. John said how much soil is cleaned up makes a difference because the radioactivity will decay to an acceptable exposure in that timeframe.

Committee Discussion

- Greg asked what the result would be if the timeline was reduced from 150 to 100 years. Greg said, again, that allowing 150 years results in greater deference to institutional controls (ICs). Greg said if you prolong the cleanup, there will be a ratcheting up of liabilities. He said allowing too much time gives leeway that contributes to ongoing contamination.
- Pam Larsen asked if there are contaminants fitting into this time frame. Dennis said the timeframe is for short-lived nuclides.
- Maynard said this is site specific and that it might work in some locations and not another.
- John said Ecology is not really looking at a 150-year timeline for the 300 Area, as an example.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. What happens if you drop back to 50 years?
2. Liabilities increase as timeline increases
3. Relate 150 yr. to consequence in short-term nuclides
4. Ability to use different timelines in different areas

Topic 4: DOE Radiological Ecological Protection Standard

Greg provided the Issue Manager comments. He said DOE's decision to use the 0.1 Radiation Adsorbed Dose (RAD) as the ecological protection standard did not receive the best of reviews from others in the scientific community. Greg said he chose to use the term "ecological" instead of "environmental", to give a voice to the "critters" as well as their habitat. Greg talked to a group of experts about the 0.1 RAD standard when DOE began to use it. Greg said these experts had not heard about this standard, and felt it wouldn't provide adequate protection. Greg said DOE is using this standard in documents without thoroughly vetting it with other stakeholders. He said if there are genetic damages, it is not protective.

Jim Hansen, DOE-RL, provided the agency response. He said a lot of this information is from the DOE document entitled "The Graded Approach." He said the 0.1 RAD is not a standard it is a grace limit, and it is has not been adopted through a ROD. Jim described the different contamination levels and the effects they have on species. He said a "null effect" is the highest concentration where they do not see an effect. Jim said there are studies where there is a great distance between null effect and adverse affect. This gradient applied to survival, growth, and reproduction goes from least to most sensitive. This is a standard method used by EPA for water quality. He said biota dose limits are conservative estimates of low effect thresholds. It is nationally used for populations. Jim said if there is protection for humans than there is protection for plants and animals, this was originally defined in 1976 by the International Atomic Energy Agency. He said the conclusions are consistent and are protective of populations, not individuals. They are not promulgated, and are consistent with CERCLA requirements.

Committee Discussion

- Gerry said the Hanford reach of the Columbia is critical habitat and when he picks up a ROD or new Environmental Impact Statement (EIS) with no discussion of biological effects of 0.1 RAD per day, it does not mean there is no effect on the individuals of the population. Jim said that the cleanup on the River Corridor needs to be considered within this. Gerry asked where he would find this information, and what the impacts are on the protected species.
- Maynard asked if there is protection for human health and protection for all other species. Maynard said if that food chain contaminants work their way up if there is some effect on the species at the bottom of the food chain. Jim replied by saying in the case of metals they are not biomagnified; this does not have effects on the food chain. Dale added there is this problem with mercury in some spots.
- Dennis said there has always been the assumption that if cleanup is protective of human health, it will be for other components of the ecosystem. Gerry said this assumption may work for exposure routes, and uranium would be a good case study for this. Gerry said these levels would not protect endangered salmon.

- Dick asked if these protective levels are controlled by the biota dose guidelines. Jim said it is not an exposure scenario. Tom said hexavalent chromium is an example of where fish are more vulnerable than humans; this assumption has examples at Hanford. He said he wants to know if this takes into account the long term effects on the genetics of a population. Tom said radiation has gotten more sensitive with time, as evidenced by the new data on plutonium; he said there should be better standards for humans. Barbara asked what happens if you do expose fish to 0.1 RAD per day, and what that means for populations verses individuals.
- Floyd Hodges referring to uranium said 0.1 RAD per day has no real meaning as to the damage it has to the ecosystem.
- Greg said this is the base assumptions that DOE is using, and it needs to be challenged. He said in the case of steelhead, there are adverse effects that studies have shown. Greg disagrees with the assumption that if there is protection for humans there is protection for the rest of the ecosystem.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. Effects of 0.1 RAD per day on individuals (rather than populations) – For critical habitats and protected species – How are impacts being disclosed?
2. Effects on lower levels of food chain magnifying/increasing as you move up the food chain (chemical) contaminants.
[For Bin]
3. Human protection does not necessarily guarantee protection of other species. (biota).
4. Application of biota dose guidelines
5. Ecology? EPA? Tribes? USFWS? Do they accept this
6. Does standard take into consideration long-term effects on species?
7. What is a consequence of LOEL exposure in setting std → individuals/population
8. Is this really the safe level that will prevent damage in the future?

Topic 5: Use of Institutional Controls and Long Term Stewardship in lieu of Remove, Treat and Dispose (RTD)

Maynard provided the Issue Manager comments. He said in the agenda the statement about the use of barriers as a first order of alternatives is incorrect. The use of barriers as an institutional control (IC) has been an issue for years. He said terms such as “in perpetuity” have popped up recently, but nothing in history has existed in perpetuity. Maynard said one of the other issues is that ICs are the cheapest thing to do today, however the cost of constant monitoring is significant. Cleaning up so that there is not a need for ICs should be the goal, and the presence of ICs needs to be minimized.

Nick provided the agency response. He said DOE never utilizes ICs as a substitute for cleanup efforts; ICs are used to complement the selected remedy. He said DOE looks to CERCLA criteria for a cleanup decision. Nick said sometimes DOE does not have a complete cleanup remedy, and ICs are considered as part of the solution. He said ICs, by themselves, are never used as the remedy. Nick reminded the group that DOE asks the public for their comments on a cleanup decision, it is then reviewed by Ecology, and then a cleanup decision is made.

He said that ICs are typically required to prevent use of groundwater during active cleanup; they are removed once drinking water standards are achieved. Nick said DOE has not said that groundwater won't be restored. DOE picked active cleanup, through going out to and getting public opinion. He said DOE does not use ICs to protect ecological receptors in lieu of engineering controls. There are specific applications to ICs but there are fundamental reasons for them. There is a perception that DOE is using them for cleanup. He said on the river, DOE is not expecting to have residential use; however they are doing cleanup that would protect for this level.

Committee Discussion

- Maynard said Nick neglected to talk about cost. He said the concern is that the use of caps in the burial grounds is a case of ICs being used for cleanup. Maynard suggested that digging up the burial grounds, rather than capping them, would resolve the issue without relying on ICs in the future. Nick said a cap is not an IC; he wanted to be clear that a cap is an engineering control. He said ICs would be telling people they do not have access to the premises.
- Susan Leckband said the best IC is that none is needed, and complete cleanup decisions should be considered when possible. She said land use should not be the factor for cleanup criteria. Susan said the Board had extensive discussion about these base assumptions and this needs to be considered. Gerry said every time there is cleanup to a level other than the unrestricted standard, there is reliance on an IC. What needs to be examined is the reliance on ICs for no recreational, commercial or other uses, and if it realistic to do this. Gerry said ICs are used even where there are active plans and remedies are postponed, which may not be protective of humans.
- Floyd said he read the Central Plateau Cleanup Completion document and that it relies on ICs and maintaining them indefinitely. He said when he looks at the TC&WM EIS, the best case scenario is groundwater contamination for 1,000 years, and nobody is going to be around to treat groundwater over that length of time. The source needs to be treated or there will continue to be contamination to groundwater.
- Vince Panesko said in Nick's response to Maynard's question he did not hear the word cost. He said there are unknowns that DOE struggles with; they are lacking information, which makes it hard to determine the cost of ICs. Nick said this is something that is not in the cost analysis, and how to integrate them in is important to examine. Floyd said if there was more cost analysis the results might be surprising.
- Greg said when reviewing proposed plans, the plans alluded to a reliance by DOE to leave things in place which creates caps and barriers and the need for ICs. He said

this also creates liability. Greg said in many cases EPA is saying it is simpler to take the contaminants out of the ground. He said the preference has been to cap, which leads to ICs. He said if ICs are going to be used there has to be a look at the lifetime costs.

- Greg asked how climate change factors in, and said there is a lack of vision into the future.
- Nick said the waste is going to be somewhere (at Hanford or somewhere else; the waste is not going away and wherever the waste goes it will need ICs. He said even if money is not spent on ICs it will be spent somewhere else; there is always a cost and a consequence. .
- Pam said that local governments do not have legal responsibility to follow up on deed certifications and other ways to ensure ICs are tracked as land changes hands or as time passes. She said using a trust fund is the ideal way to ensure adequate funding for the maintenance of ICs over time.
- Susan said there is one more addition to the cost and liability issue. She brought up that the Site-Specific Advisory Board has issued advice that DOE creates a pocket of money for long-term stewardship; yet, there is still no funding set aside for this
- Pam said having the ICs as an option is important.
- Gerry said he thinks the discussion point of maintaining records is too narrow; there is a need to include the element of enforceability. Maynard said enforceability and validity of cost estimates are difficult. Susan said to add liability to Maynard's list.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. Why not take care of cleanup now (e.g. burial grounds) rather than incur cost of ICs?
2. How ICs are defined (seems to be different definitions) e.g. 300 area ICs/exposure scenario, land use
3. Every non-unrestricted use relies on institutional controls
4. Use of ICs during interim of remedy completion – may not be protective
5. Cost/liability of ICs not adequately disclosed/identified
6. Development of costs is ongoing issue
7. Establishment of trust fund to ensure support of ICs – identifiable pocket of money at each site
8. How to manage: Maintenance of records to ensure ICs are tracked (e.g. deed restrictions)
9. Local gov't obligations
10. Enforceability

11. Validity of cost estimate
12. Liability
13. Putting ICs in ROD
14. Why do we have the perception that you prefer caps over RTD?

Topic 6: Integration of DOE's Trust Responsibility in Decision-making

Wade Riggsbee provided the Issue Manager comments. He said the topic of integration of DOE's trust responsibility in decision making was prompted by questions about where the programs were going and if there was a commitment to natural resource management. There is also a tribal trust responsibility. Wade said DOE does not have budget workups for natural resources, and that shows a lack of commitment to the cost of capping. He said land use planning documents show the process but not the commitment, and the Board wants to hear these commitments.

Jim provided the agency response. He said the Hanford Natural Resource Trustee Council (HNRTC) is developing a white paper identifying their expectations with respect to Natural Resources Damage Assessment (NRDA) considerations during remedy selection. Jim said the National Contingency Plan (NCP) is consistent with the typical NRDA process. He said there are important differences in data needs and decision processes between CERCLA ecological risk assessment and NRDA injury assessment. He suggested people look at the papers that have been written about these differences for a good summary.

Jim said these concerns regarding assessing potential injuries resulted from a workshop of agencies, industry and consulting firms. DOE has to combat scientific uncertainty in injury, as well as balancing and modifying criteria in the CERCLA decision process. He said DOE established the HNRTC to provide advice on cleanup decisions and actions, and DOE has a government to government relationship with the tribal nations and initiates consultation with them on cleanup decisions. Regarding funding (stated budget for 2010), DOE is implementing its policy and integrating natural resource concerns. Jim said trustees are encouraged to identify and explain their concerns to be considered in cleanup decisions.

Committee Discussion

- Dale agreed with Jim and said DOE is now looking at assessments becoming a bigger part of the cleanup process. He said the real issue comes from the TPA not looking at the cost and liability associated with cleanup. The TPA spends the money to remove material or remediate the site.. He said during a presentation at the TC&WM EIS public workshop, someone asked about NRDA and the presenter did not know what it was. Dale also said damages are being assessed inappropriately. He said this is something that is making the CERCLA decisions and the NRDA decisions less of a consideration.

- Greg read the question from the agenda “how do you assess and ensure that the cleanup actions being considered do not create potential damage claims in the future?” He said there is a notion that when looking at sites there are options that would be a part of the decisions. Greg said when this piece is developed these are the factors that need to be included, along with consideration for long term liability. He asked if there was some sort of decision matrix that DOE has for decision making and management.
- Wade said these projects do not integrate NRDA. He said there is no trustee representation here and there is not enough integration in the process, which needs to be established.
- Barbara said there is more to NRDA than restoration, there are services to environments and people.
- Dick asked how project managers estimate costs and if there is a calculation. He said the elements of calculating cost estimates need to be defined. Jim said it is at the end that the trustees know these costs; the process of NRDA quantifies damage and then cost. Susan asked if cost projections could be made - this question has never been answered for the HAB. Shelley said it seems that a dollar commitment is needed to quantify the damage assessment and put it into the remediation efforts. She said no money is allocated to doing this work from DOE headquarters.
- Gerry said a trust is a fiduciary duty. He said there needs to be clarification regarding damages. He said when DOE writes a ROD it forces them to consider the trust responsibility through damages. Gerry said there needs to be discussion on how DOE incorporates everything and have policies to take this trust responsibility into account.
- Pam said she does not consider the trustee council to be shrinking.
- Gerry said if he picks up a ROD he should be able see how the trust responsibility influenced the decision.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. NRDA liabilities not being considered in remedy selection
2. How do you assess & ensure cleanup actions being considered do not create potential damage claims in future (creation of decision matrix?)
3. How/when will we see greater integration of Trustees into cleanup decisions, & projects integration (RI/FS)?
4. There is more to NRDA than restoration (e.g. services provided to people)
5. How are costs estimated/quantified?
6. Known process? > retrospective
7. Will \$\$ associated w/compensation come out of cleanup?

8. \$\$ commitment to quantify damage, then \$\$ for compensation
9. How are trustee's best interests being considered in decision-making (up front)?
10. Ask trustees what they need, what they are looking for (NRTC)

Topic 7: DOE's Use of Modeling versus More Characterization

Dale provided the Issue Manager comments. He said a model is a simulation where numbers are put in and what comes out simulates a conceptual reality. He said in the 100 Area there are documents that reference simulations. He is concerned because there could be errors in the models. He said the model data cannot be made into reality. Dale said he understands that between DOE and EPA there is a need for models to simulate the problem so they know where to go next. He said there is a perception in the Rivers and Plateau (RAP) committee that the modeling is driving decisions, which could potentially cause problems.

John Morse, DOE, provided the agency response. He said modeling is used to support characterization and evaluate how contaminants have been distributed (retrospective) and what may occur in the future (prospective). John said DOE does collect a lot of data, and he gave examples of Hanford field characterization. He said DOE has used the oxford tool for quite some time and it has informed decisions. He said DOE has fibrotic cables in the bed of the river to identify temperature changes to pinpoint where the upwelling areas are. John said DOE wants to continue to use characterization data and he said there is agreement that results have been consistent with modeling data.

Committee Discussion

- Maynard said he is concerned about the burial grounds. He said DOE seems to be staying away from characterizing because once the material is taken out there might be a lot of work to separate it. He said these contaminants live forever, and it might be a lot cheaper to dig the material up rather than digging thousands of holes for characterization.
- Maynard said it is true that no matter what, ICs will be needed. He said it is still preferable to have them in a place that is better monitored and surveyed.
- Dennis said ultimately EPA collects data on all the sites to make sure the remedy is correct. He asked how much remedy can be had in the pre-ROD stage. The right ROD has to be picked.
- Susan asked how much uncertainty can be lived with. Dennis said picking the right tools and the assumptions that are put into the model is important and this is why data is collected to inform the assumptions. Sometimes there are mistakes from bad assumptions and EPA tries to avoid these pit falls.
- Greg said the infiltration rate was 3.2 cm the previous day. He said that characterization is static and does not account for the future. Greg said the models fail to look at the "what if" scenarios such as climate change. He asked what if there is

more than a 3.2 cm infiltration rate? He said if you put these potential climatic conditions in the models it will be much higher. The models are being restricted.

- Barbara said the huge amount of data collected before the ROD is written is an issue.
- Gerry asked about post-ROD characterization. Dennis said it will be discussed after lunch.

Issues for further discussion

HAB members identified the following issues for further discussion (a red underline denotes a topic that the issue managers highlighted for discussion after lunch):

1. Need more characterization
2. Dig up burial grounds rather than continuing to invest in characterization
3. How much uncertainty can we live with?
4. Using models to run “what if” scenarios
 - Flexibility to look at probability
 - “Sensitivity analysis”
5. Timing & sequence – what do you collect when? (Pre-ROD, post- ROD, implementation)

RECAP AND FRAMING OF THE AFTERNOON DISCUSSION

Greg said the issue managers reviewed the issues noted on the flip charts from the morning session, and identified what was most important to talk about in the afternoon session.

Dale said, for now, the issue managers feel that further discussion on groundwater assumptions is not needed.

Topic 1: “Unrestricted Use” compared to “Unrestricted Surface Use”

Issues to discuss:

- ✓ Looking for total unrestricted use
 - ✓ Perception that foster misunderstandings (from agency public presentations)
 - ✓ How to present to the public?
 - ✓ Should exposure scenarios be inclusive of scenarios w/ exposures > 15 feet & transport mechanisms?
- Dale said the idea of “unrestricted surface use” in places like Environmental Restoration Disposal Facility (ERDF) will have to have restrictions. He said it is a

misunderstanding that there is a tendency for restriction problems. He said this is because the reasons for, and specifics of, the restrictions are not clearly explained for people.

- Greg said the EPA needs a better defined picture for the river corridor; it is not “unrestricted use”, it is “unrestricted surface use”. He said there is a need to have a better message for the public.
- Dale said the message being delivered on the River Corridor is that cleanup is almost done. He said, in reality, surface cleanup is nearly done, but not total cleanup. John Morse said that until groundwater cleanup is complete DOE will have to have restrictions on utilizing the groundwater.
- Greg asked about fishing on the Hanford Reach Monument. John Morse assured him that fishing is okay.
- Greg said he wants this process to provide a clearer picture as far as transferring from DOE to Fish and Wildlife.
- Nick said there are some surface restrictions along the river corridor, around the reactors, and the 210 square miles would be mostly unrestricted. DOE has been working on this and DOE is trying to convey the message that it is almost there.
- Dennis asked about presenting this to the Public Involvement and Communications (PIC) Committee for discussion on how to make this information clearer to the public. He said the exposure scenarios should be inclusive.
- Dennis said from a risk perspective the materials might not have to be taken out, however the transport mechanism has to be paid attention to. He said it will depend on the contaminant..
- Maynard suggested using another term such as limited use; he thinks there is a perception with “unrestricted” that people can do whatever they want. He thinks it can be better understood with different terminology. Nick said DOE is open for suggestions. Greg said that everyone needs to make sure that people do not think “unrestricted” means they can drink the water for example. Nick suggested trying to convey the message correctly on paper. Paula Call, DOE-RL, suggested that the committee write a paragraph to communicate this.
- Wade said the perception that there will be contaminated springs, and that plumes will be hydrating the area which will require restrictions is contradictory to “unrestricted surface use.” Nick agreed with Wade and said there is a difference between the plumes and discharges and that needs to be addressed.
- Barbara said there is a mix up with the term “land use” that needs to be looked at. Nick said DOE is looking at a whole range of scenarios, tribal, residential and other exposures in the risk assessment to make a clear decision. Barb said to use options instead of land use. Maynard said he has seen documents that the decision is based on what the land use will be. He said if the land use is going to be industrial it can only be a certain way. He said if this is not the case than that needs to be clarified and if it is the case it needs more discussion.

- Floyd said there are long term discharge effects in the river corridor if you do not clean up the Plataea now.

What Happens Next?

HAB members identified the following next steps for this topic:

1. Help communicate what U.S.U. means in terms of cleanup. (option to say “limited use” terminology)
2. “Mass of contamination” principle and engineered structures... do they apply to CP? Need more discussion
3. Clarify connection between land use and remedy.

Topic 2: Groundwater cleanup – “Highest Beneficial Use” Compared to “Intended Use”

HAB members determined that no further discussion or action items were needed for this topic at this time.

Topic 3: 150 year timeline

Issue to discuss:

✓ What happens if you drop back to 50 years?

- Greg said going back to core values of being most effective, what would fundamentally change if DOE changed from 100 years to 30 years or 60 years.
- Larry Lockrem gave an example of an ecologically restored site: he said the TPA is looking at the site as unrestricted, this will decay in 120 years, from now to then the site will only need to have vegetation management.
- Greg said if DOE sets a timeline less than 100 years it will accelerate the cleanup.
- Nick said the timeline sets aside time to assess and make a decision. Pam said it is a question of dollars and priorities. Dennis said the 100 years is in place because it started to control access in perpetuity. He said risk-based end states became end states; from his perspective, it should result in a better cleanup if ICs in perpetuity are trusted. Dennis said the idea is to create reduced cleanup due to keeping people and animals out. He said in certain instances it could make sense to reduce the timeline; however, a site specific decision can be made in that case.
- John Price said waiting 30 years after the cleanup would allow the contamination to decay to the residential level. He said for cleanup to be done today the contaminated material would have to be trucked out. He said that it is a tradeoff between this and doing something like 60 deep wells.
- Wade said the area of Gable Mountain has a different set of controls for cleanup and it would be helpful to get tribes involved; 150 years can be used on that but there are other issues that need to be looked at.

- Vince asked what the status was of the Gable Mountain documents. John Price said there is a feasibility study that did not come to a decision and it will be included in the Outer Area proposed plan documents.

What Happens Next?

HAB members decided that action items were not needed at this time.

Topic 4: DOE's Radiologic Ecological Protection Standard

Issues to discuss:

- ✓ Application of biota dose guidelines
 - ✓ Ecology? EPA? Tribes? USFWS? Do they accept this?
- Greg said there are standards being used that have not been agreed upon by other agencies. He said that the tribes have concerns about the protection of the river. He asked if each of the EPA, U.S. Fish and Wildlife Service (USFWS), Ecology and tribal representatives would speak to their view of these standards.
 - Larry said the conclusion from the federal government's point of view is that the EPA has looked at ecological protection standards but has not endorsed it. He said the EPA has not challenged it or refuted it. Greg asked if anything has been written taking away the responsibility. Larry said no.
 - Joe Bartoszer, USFWS, said he is not familiar with the ecological protection standard being used, he is familiar with the plant and animal documents but not sure how they relate. The ICRP 108.58 just came out in 2008 and USFWS has been working on it.
 - Barbara (Confederated Tribes of the Umatilla Indian Reservation), asked that there be a peer group put together to look at this. Wade (Yakama Nation) said he does not have a background to do that.
 - Greg said this issue has been on his radar. He said he believes this proposal is not supported by anybody and is not factually correct.
 - Jim Hansen said there are population damages and genetic damage that show up all over.
 - John Price said Ecology looked at this while scoping the ecosystem risk assessment; as far as Hanford goes, a risk assessment should be done. He said DOE and Ecology are consistent in their approaches. He said as for endangered species, it is intended to address populations of animals.
 - Gerry said when he picks up a ROD or RI/FS he is looking at screening levels that are not contaminants of concern. He asked if that is how screening levels are being used. John Morse said DOE is working on a base line risk assessment; the ROD is based on this. Gerry said he did not see the connection with the base line risk assessment and the work plan.

- Larry said EPA is looking at all contaminants that were potentially released. He said there was retained RAD; however there was an ecosystem screening they might not have. He said EPA ran that result through an ecosystem and human assessment and the RADs dropped out. Larry said EPA collects a lot of RAD data in the field and it is run through a risk assessment. Jim said the RAD document uses 1.1 as a basis but it is not used as a flat 1 RAD per day. Larry said this is a combination of conservative estimates and over-estimating the dose to the ecological receptors, but should be protective at the top level.
- Greg said there was a study on fish in the Columbia and there were unsafe contamination levels. He asked what the process was for setting these standards. He suggested looking at individuals and not just populations. Greg said the tribes state this and EPA needs to look at this for the long term.
- Gerry said he wanted to know if there is action to protect the species at risk. He asked how clean up decisions are being made with screening levels.
- Gerry said the Board has not looked at the massive use of herbicides and pesticides regarding ICs. He wants the Board to look at this. Barbara said it is also an ecosystem stressor that would exacerbate the radiological issue. Pam said that the plants will soak up contaminants. Gerry said integrated pest control needs to be looked at strategically. The group decided to include this in the Bin. Maynard said maybe the TPA should be encouraged to address these questions and to work toward a mutual understanding. This could be a topic at the next RAP meeting.

What Happens Next?

HAB members identified these questions for follow-up via advice sponsored by the RAP Committee:

1. Are we acting to protect species at risk?
2. How are cleanup decisions being made w/screening criteria?
3. Use of pesticides & herbicides along the river. May be eco-stressors [*For Bin*]
4. Urge TPA agencies to answer questions (cooperatively) by advice thru RAP

Topic 5: Institutional Controls and Long Term Stewardship

Issues to discuss:

- ✓ Why not take care of cleanup now (e.g. burial grounds) rather than incur cost of ICs?
- ✓ Why do we have the perception that you prefer caps over RTD?
- Maynard said most of the issues on the list will be addressed in the March long-term stewardship workshop. The two areas the issue managers talked about discussing further today were the perception that DOE wants to use capping in burial grounds

and digging up the burial grounds and moving the material to ERDF because it has better regulations and surveillance.

- Maynard said the question is about perception. He said the real problem is a strong belief within the HAB that capping is the answer which needs to be addressed. Nick said DOE will look at the waste sites in the feasibility study. He said this does not need to be in the presumptive remedy, DOE will do an analysis and CERCLA will be used. He said using a range of solutions DOE will weigh the pros and cons with Ecology.
- Maynard said there are still concerns over capping and if it is not the intent to use capping the HAB needs to know that. Nick said DOE does not want to dig up sites next to the canyon, for example, until they find out if it will be best to cap there. Maynard said it is the perception that needs to be worked on. Nick said DOE will do it by the book.
- Maynard asked if there will be adequate characterization, people need the information about the sites. Nick said DOE needs to find a balance between what is expected and the perceptions about capping.
- Maynard said that it might be cheaper to dig it up than characterize it.
- Craig Cameron, EPA, said there will be contamination at depth and what to do with it will not be known. He said the contamination is a long way from the groundwater still. There is a lot more money needed to have viable options for this. Craig said there will be sites needing ICs no matter what. He said there are tradeoffs when deciding what to do on a site with shallow and deep contamination and it is not always a matter of cap or no cap.
- Dick said there was no talk about the NRDA costs regarding the U Plant and wanted to know if these considerations are incorporated. Craig said NRDA costs were not incorporated. Craig said the U plant also included the institution of the cap. Dick recalled that U Plant met the regulations without the cap; his main concern is that it would be applied downstream. Craig said they have to look at each canyon on its own and do the RI/FS work.
- Wade said that there has been a lot of engineering. He said there were studies on the canyons saying they are not suitable. Wade said this means there are contaminants leaking and these issues need to be discussed.
- Wade said there is no precedent of building on top of a cap. Craig said EPA tried this for the U Plant to save money, however this was not the case.
- Gerry said that at the TC&WM EIS workshop, cribs and trenches and retrieval were discussed. He said no one is looking at ten thousand years for CERCLA decisions. Gerry said he was looking at the B and T tank farms and the six cribs associated. He said there is sensitivity in the impacts in cap verses retrieval. Larry said Gerry is right. He said the EIS looked at every alternative and fails in groundwater protection. Larry said the CERCLA process finds remedies, and if EPA is in the same place as the EIS that can be considered a failure.

- Gerry said there are lessons that can be taken out of this discussion on using the EIS as a tool for differential capping vs. retrieval and cumulative impacts of capping.
- Maynard said digging in the burial grounds could help track plumes.
- Barbara asked what kind of costs and liabilities are associated with restoration, caps and barrow pits.
- Floyd said are long term caps and ICs really aren't viable.

What Happens Next?

HAB members decided to follow-up on these questions:

1. What are the lessons learned from the TC&WM EIS on differential impact capping, retrieval & cumulative impacts of capping?
2. What kinds of damages & cost/liabilities associated with restoration, caps, (etc.) lost use due to ICs (Barb to take back NRIC)?
3. Are the concepts of ICs/caps viable?

Topic 6: Integration DOE's Trust Responsibility

Issues to discuss:

- ✓ NRDA liabilities not being considered in remedy selection
 - ✓ How do you assess & ensure cleanup actions being considered do not create potential damage claims in future (creation of decision matrix?)
 - ✓ How are trustee's best interests being considered in decision-making (up front)?
- Greg said it is not apparent for anyone from upper management to field workers what damages can be assessed. He suggested putting a decision log together to make sure there is not more liability created. Greg suggested discussing NRDA in decision making.
 - Jim said he understands the concept of the cost of NRDA, yet does not know how to get there. He said from a process standpoint there is integration relationship between injury and risk. He said if DOE cleans up to risk levels, then there is a limit on injury. He said the trustees can provide input on this. He said reaching this threshold may or not be practical, but he believes there is a common nexus. He said this is important for the trustees.
 - Greg said there might not be information from the tribes about sensitivities. Jim said he is not sure if the trust organizations are at that level. Nick said DOE talked about that with Gable Mountain; he thinks DOE does identify this issue. Greg said that is in the future, and he is looking at historical paths to better understand by creating more transparency in decisions. He said there needs to be better documents to inform tribes.

- Greg said the tribes probably did not have input in the Central Plateau Cleanup Strategy. Nick said that DOE has met with them. DOE has gathered to strategize with other parties, and have gotten opinions to create the strategy; there are formal opportunities to have that happen down the road.
- John Beckstrom said this will be done in parallel with the response work. He said this transitioned into the injury assessment and some of the issues raised were brought up at other meetings concerning NRDA and cost analysis. If a cleanup is not protective of residual waste, it is still causing unjust results. For example, with chromium injury continues to occur even after the cleanup. If the trustees have to do a second round, that will be a restoration project and then there is lost use and service, which is what is being faced now. A possible solution would be a line item referring to injury assessment.
- Wade said there is a need for integration of all the parties to create more awareness.
- Dick said he understands the cost damage with fish and river contaminants, but how are the mounds of soil in the Central Plateau assessed? He thinks this needs to be in the assessment.
- Maynard said he wants to know that this can be demonstrated in the ROD and that NRDA is at least recognized in the remedy.
- Larry said there is possible HAB advice for this topic.
- Dale said maybe CERCLA should be added on; with Superfund you can clean up and move on to NRDA. He said this is a large area with many big problems, so if something is done now, instead of capping, it becomes more important and it is considered sooner. Greg said if this is moved to the decision part of NRDA, it opens up a lot of issues. He said a person from a tribe is not looking at CERCLA, the gap needs to be narrowed and the NRDA piece needs to be included.
- John Price said, as far as policy advice, cleanup and NRDA costs should be upfront.
- Gerry said again that everyone is talking about NRDA, and is focusing on treating the symptom and not the problem.
- Craig said just because you are on a certain site does not mean all problems are solved by sending the material to ERDF. He said it is not all or nothing.

What Happens Next?

1. HAB members identified the following next steps for this topic:
2. HAB advice → demonstrating through disclosure in RODs, that Trust Response NRDA need have been factored in and incorporated into the decision. (part of CERCLA process)
3. Board presentation by Paul Schaeffer
4. Plug in NRDA piece up front in decision process – before plans are written. Would you do cleanup differently if NRDA Trust Responses were considered?
5. ZP area waste sites

6. Outer area proposed plan

Topic 7: Modeling versus Characterization

Issues to discuss:

- ✓ How much uncertainty can we live with?
- ✓ Using models to run “what if” scenarios
 - Flexibility to look at probability
 - “Sensitivity analysis”
- Dale said the HAB needs to suggest to the TPA that modeling is important and critical. He said once a model is created it is an entity and it should be used for predictions; however it is just a numerical representation and that needs to be remembered.
- Greg said climate change and the related repercussions related should be discussed.
- Craig said the EPA has talked about climate data from lakes, ponds and ice in the Northwest and the range of precipitation. He said EPA has used some of this data to create some predictive models; however they have not been finalized. He agrees with Greg that more needs to be done.
- Tom Carpenter said he is leery of modeling without good data. He said relying on models has created problems, such as evident with the leaking tanks. Tom said the characterization needs to be good. Pam was alarmed that that there was only one option run. She said the last EIS got thrown out because of modeling.
- Greg said it boiled down to transparency. He said what is needed is more knowledge on the data ranges. He has asked where the precipitation numbers come from. The number 3.2 came from infiltration data collected over many years. He suggested putting transparency advice together, so tribes or anyone can run something in the models.
- Barbara said there needs to be focus on the “what if’s” and the parameters that make the most difference (sensitivity analysis).
- Wade said he is looking at the reality of the applications of modeling. He has had experiences with models failing and thinks the practical uses of modeling need to be addressed.
- Floyd said it should be emphasized that modeling is not conservative; there are a lot of complex materials that go into them. He said the best model is not going to give an exact answer but they are still helpful.
- John Morse said the handout talks about the advantages of modeling, and the pitfalls of substituting modeling for characterization. He said in CERCLA there is no requirement for modeling, but there has to be an understanding that simulations can help the process. He said it is a tool, not an answer.

- Nick said he thinks that there is a need to have a balance between modeling and field characterization; they need to complement each other.
- Shelley said to make sure there is adequate independent review.

Craig said there is value to the United States Geological Survey (USGS) overseeing this. He thinks it is an issue that a lot of these models can be run with just enough knowledge to be dangerous, and there should be experts running the models.

What Happens Next?

HAB members identified the following next steps for this topic:

Advice?

1. Know ranges of models used in analysis – Run scenarios based on needs of customers.
2. Run sensitivity analysis to determine which parameters make the most influence.
3. Make models simulate reality
4. Get the right mix of characterization & modeling
5. Adequate review of modeling, independent expert

Bin topics: *(as captured on flip chart notes by Susan H.)*

1. Groundwater plumes and unrestricted use, discharges (springs) to river
2. GW discharges to riparian, river
3. Effects on lower levels of food chain magnifying/increasing as you move up the food chain (chemical contaminants)
4. Use of pesticides & herbicides along the river -- may be eco-stressors

Handouts

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

- A Nontechnical Guide to Groundwater Modeling: With Specific Reference to the U.S. Department of Energy's Hanford Site, Peter Willing Ph.D, August 2007.
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Attendees

HAB Members and Alternates

Tom Carpenter	Floyd Hodges	Maynard Plahuta
Shelley Cimon	Pam Larsen	Gerry Pollet
Greg deBrueler	Susan Leckband	Wade Riggsbee
Dale Engstrom	Sandra Lilligren	Dave Rowland
Ken Gasper	Liz Mattson (Phone)	Dick Smith
Laura Hanses	Vince Panesko (Phone)	Bob Suyama

Others

Paula Call, DOE-RL	Rick Bond, Ecology	Dale McKenney, CHPRC
Nick Ceto, DOE-RL	Madeleine Brown, Ecology	Janice Williams, CHPRC
Joe Franco, DOE-RL	Ginger Wireman, Ecology	Barbra Harper, CTUIR
Jim Hansen, DOE-RL	Ron Skinnarland, Ecology	Dru Butler, MSA
Matt McCormick, DOE-RL	John Price, Ecology	Barb Wise, MSA
John Morse, DOE-RL	Craig Cameron, EPA	Ted Poston, PNNL
John Neath, DOE	Dennis Faulk, EPA	Joe Bartoszer, USFWS
Connie Smith, DOE	Larry Gadbois, EPA	John Beckstrom, Yakama Nation
Margo Voogd, DOE	Emerald Laija, EPA	Susan Hayman, EnviroIssues
		Blair Scott, EnviroIssues