

OREGON HANFORD WASTE BOARD

Minutes

Regular Meeting

June 18-19, 2002
Columbia Gorge Discovery
Center, The Dalles

Attendees (Excluding Speakers):

Voting Board Members: Casey Beard, Norm Dyer, Norma Jean Germond, Michael Grainey, Barbara Jarvis, Fred Lissner, Eric Nisley, Ted Repasky (for Armand Minthorn).

CH2M Hill Hanford Group: Scott Petersen.⁺

Nez Perce Tribe: Gabriel Bohnee.

Pacific Northwest National Laboratory: P. Evan Dresel.⁺

U.S. Department of Energy: Peter Bengtson,^{**} Jeff Frey,^{**} Kevin Leary, Marla Marvin,^{**} Steve Weigman.^{**}

Public: Stuart Harris, Dib Goswami, Althea Huesties-Wolf, Tristan Jenkins,^{*} Wayne Kinney, Wayne Lei,^{*} Rick Martinson,^{*} Pat Morse, Ruth Siguenza, Dick Wilde.

JUNE 18, 2002

Working Lunch: Announcements & Administrative Business

Ken Niles introduced Tom Stoops, the Oregon Office of Energy's new hydrogeologist. Mr. Stoops described briefly his education and experience, including working on groundwater remediation at the Idaho National Environmental and Engineering Laboratory.

Mr. Dyer moved to approve the March 2002 meeting minutes; Ms. Jarvis seconded the motion and the minutes were approved unanimously.

Ms. Safford announced that the Oregon State Bar's New Lawyers Division recently honored Ms. Jarvis with its pro bono challenge award for sole practitioners. Ms. Jarvis contributed 260 hours of free legal service.

⁺ June 18, 2002 only.

^{**} Participated via conference call on Tuesday, June 18, 2002 only.

^{*} June 19, 2002 only.

March 2002 Meeting Follow-up Reports

1. 618-11 Burial Ground Investigation Report

Ms. Safford reported that during the March meeting several board members had questions and requested a briefing on this topic. Staff invited John Morse, the U.S. Department of Energy's manager of the Groundwater Vadose Zone Integration Project, to discuss the 618-11 Burial Ground Investigation. The meeting notebook contained a copy of the invitation letter to Mr. Morse with questions from the board. Mr. Morse's presentation is described below.

2. Cleanup Constraints and Challenges Team (C3T)

Ms. Safford reported that the board sent a letter to Keith Klein, U.S. Department of Energy, Richland Operations Office, Harry Boston, U.S. Department of Energy, Office of River Protection, John Iani, U.S. Environmental Protection Agency, Region 10, and Tom Fitzsimmons, Washington Department of Ecology, commending the C3T's work and recommending public involvement in development of the work plan to implement their Memorandum of Understanding. The April information mailing to board members contained a copy of the letter.

3. Morrow and Umatilla County Commissioners Presentation

Ms. Safford reported that board members suggested a presentation to the Morrow and Umatilla County Commissioners about Hanford. On April 16, Deanna Henry and Ken Niles discussed the Hanford cleanup and the Oregon Office of Energy's emergency preparedness program with representatives of both counties. (See also the discussion of public involvement activities on page 6.)

4. Hanford Cleanup Information Packets

Ms. Safford reported that Larry Clucas, Jill Eiland and Paige Knight requested Hanford information packets to distribute. Staff compiled and provided the materials to them. Ms. Safford asked board members to let her know if they would like information packets sent to them.

618-11 Burial Ground Investigation Report

John Morse introduced Kevin Leary, the U.S. Department of Energy's new project manager for the 618-11 and 618-10 Burial Grounds cleanup. Mr. Leary distributed a handout with an overview of the burial grounds describing their locations, contents and cleanup issues. (See record copy of meeting notebook.) He said no one knows exactly

what these burial grounds contain. The Richland Operations Office does not currently have the technology to clean up these burial grounds. The high levels of radioactivity associated with the wastes in these burial grounds require special safety procedures for workers. The U.S. Department of Energy is considering new robotic applications for this clean-up project. It is trying to learn from the experience of cleaning up Pit 9 at the Idaho National Environmental and Engineering Laboratory. Mr. Leary said the ideal clean-up approach would involve constructing a modular facility to characterize, contain and package the waste for transport by rail to the Waste Isolation Pilot Plant.

Ms. Germond said the Waste Isolation Pilot Plant will be full by the time this cleanup project begins. Mr. Leary said the U.S. Department of Energy is discussing that issue now.

Mr. Dyer asked where the high tritium waste is located and how it will be addressed. Mr. Leary said it is in the caissons, which emit radioactivity levels as high as 500 rad/hour.

Mike Goldstein, U.S. Environmental Protection Agency, described the burial grounds in more detail. He showed aerial photos of the trenches being constructed and locations of the monitoring wells. He also showed graphics of the transport truck, casks and mechanism for filling the caissons. He said the burial grounds were closed in 1967 by covering them with two feet of clean fill. In 1983, the U.S. Department of Energy added another three two feet of fill and planted grass.

Mr. Goldstein reviewed briefly the history of the discovery of the tritium leaking from the 618-11 Burial Ground. The reading in 2000 was 400 times the drinking water standard. He complimented the U.S. Department of Energy's aggressive approach to the investigation.

Jane V. Borghese, CH2M Hill Hanford Group, discussed the tritium plume investigation in more detail. She distributed a handout outlining her comments. (See copy in meeting notebook.) Ms. Borghese discussed the phased characterization process, installation and sampling of gas probes and groundwater samples obtained. The investigation sampled 22 existing wells.

In response to a question from Mr. Nisley, Ms. Borghese said no seasonal differences had been observed in the sampling results. Stuart Harris asked if the uranium detected was naturally occurring. Ms. Borghese said the analysis was for total uranium so it is unknown whether the uranium detected was manmade or naturally occurring. Mr. Harris also asked about carbon tetrachloride. Ms. Borghese said there are low levels at the burial ground and they are being watched.

Mr. Goldstein said the investigators installed soil gas probes downgradient in order to determine where to obtain grab samples of groundwater and where to concentrate clean-up efforts.

Mr. Goldstein said the investigation showed that the tritium plume is small, highly concentrated and naturally attenuating due to the short half-life of tritium. There is no immediate receptor being impacted. Potential future impacts to the river will be small. The investigators made sure that the nearby Columbia Generating Station's wells do not contain tritium. Accordingly, the Environmental Protection Agency agreed with the U.S. Department of Energy that monitored natural attenuation with enhanced gas sampling is appropriate. No interim action is necessary now. Mr. Goldstein said these are basic assumptions in deciding where to put overall clean-up resources. This approach to clean up will be reevaluated as new data is collected.

The April 2001 Record of Decision established removal, treatment and disposal as the remedy for this burial ground. The April 2002 Tri-Party Agreement milestones for this burial ground require design to commence in 2004 and completion of remediation in 2018. There has been no evaluation inside the fence. EPA sought milestones as a catalyst for beginning the cleanup process.

Mr. Niles noted that the State of Oregon asked for interim milestones in order to meet the 2018 date. Mr. Goldstein said the Tri-Parties intend to add interim milestones as they learn what will be needed to clean up these burial grounds.

Oregon Priority Area Updates

1. Proposed Hanford Accelerated Cleanup Plan

Marla Marvin and Jeff Frey, Richland Operations Office, and Steve Weigman, Office of River Protection, joined this discussion by phone.

Mr. Niles reported that the Oregon Office of Energy is drafting written comments on the proposed Hanford Accelerated Cleanup Plan for submission during the last week in June. The Oregon Office of Energy will consider the board's positions in formulating the Oregon Office of Energy's comments. Mr. Niles said this proposed plan provoked lots of negative comments and discussions. While the Oregon Office of Energy does not agree with everything in the proposed plan, the Office of Energy will do its best to help the Department of Energy and regulators move forward if there is a way to accelerate cleanup without degrading the quality and safety of cleanup.

Ms. Marvin said the intent is to have the accelerated cleanup plan in final draft by July 15 for submission on August 1. Congress should take action in allocating the \$433 million in September.

Mr. Niles said the one element causing the Oregon Office of Energy the most concern is closing tanks prior to completion of the vitrification facilities. The Oregon Office of Energy sees no compelling reason to close the tanks now. The Department of Energy proposes to complete vitrification of Hanford's high-level tank waste by 2028. To do that, the Department of Energy will need to complete the vitirication facilities sooner than planned and operate them much more efficiently than planned. Much of the tank waste would be treated using alternative technologies, such as grout, rather than vitrification. Mr. Weigman said the Office of River Protection is trying to follow the Tri-Party process to investigate technologies for closing tanks. There is no agreement yet with the Department of Ecology on how to close the tanks.

Ms. Germond asked about steam reforming. Mr. Weigman said the Office of River Protection is evaluating the technique. Ms. Germond expressed her concern that there is not sufficient time under the existing milestones to investigate and implement this technique.

2. Tanks Issues Update

Mr. Huston reported that the U.S. Department of Energy's Office of River Protection delivered the Recovery Plan to the Department of Ecology. The plan describes how the Office of River Protection will meet the scheduled start of operations date even though the start of construction will be delayed by at least one year. The Office of River Protection proposes to accomplish this by using a construction technique know as "fast tracking." The Oregon Office of Energy provided comments on the plan.

Mr. Huston discussed briefly the new technologies described in more detail in the briefing notebook memo (tab 4). He said Ecology is unenthusiastic about the term "new technologies." Ecology prefers supplemental treatment technologies.

Mr. Harris cautioned the board about the Office of River Protection's current proposal for addressing tank waste. He expressed skepticism about the plan to beef up and run the Phase I Plant to treat 50 percent of the tanks wastes and then use supplemental technologies to treat the remainder.

In response to a question from Mr. Nisley, Mr. Grainey said the accelerated cleanup plan meets Tri-Party Agreement milestones.

3. Spent Fuel Project Update

Mr. Dunning reported that the Defense Nuclear Facilities Safety Board is questioning the Department of Energy's ability to meet Tri-Party Agreement milestones for this project. Equipment problems (described in the briefing notebook) caused delays, but the project is again processing fuel. Mr. Dunning noted that there might be additional delays when work begins on removing fuel from the second basin, which is dirtier.

He said the Department of Energy might miss the July 2004 Tri-Party Agreement milestones by as much as a year. Ms. Germond complimented the progress, despite the delays.

4. Public Involvement Activities

Susan Hughs discussed the issues and action items associated with board public involvement. She reviewed the recent and upcoming Tri-Party Agreement public involvement activities in Oregon. She noted the dates of upcoming public meetings about the Solid Waste Environmental Impact Statement. She also discussed the public involvement schedule for the Tank Waste Remediation System Supplemental Environmental Impact Statement. Ms. Germond suggested that the Oregon Office of Energy prepare a briefing on the supplemental environmental impact statement for the board.

Ms. Hughs reported that the Oregon Office of Energy expects to triple the number of contacts through its Community Outreach Initiative. She distributed updated presentation lists. Ms. Hughs noted the office's involvement in an Earth Day event at the Oregon Garden and planned involvement in a science teacher's association meeting in the fall. Mr. Nisley suggested participating in the Country Fair in Eugene.

Deanna Henry reported that a broad group of individuals participated in emergency preparedness meetings in Morrow and Umatilla counties. The participants provided feedback about state actions such as embargoes. Mr. Beard said businesses want the Oregon Office of Energy to conduct a monitoring program to verify the absence of contamination. Area businesses also want the state to move aggressively to prevent contamination from reaching processing plants.

Barbara Jarvis mentioned that an anti-nuclear group with a mock waste cask came through Ashland. She described the group's tactics (e.g., disseminating misinformation) and asked if the Oregon Office of Energy had any Yucca Mountain transportation information. Mr. Niles said the Oregon Office of Energy does not have a white paper on transportation of high-level waste. He said the focus on the issue probably would die down shortly after the Senate takes action to override Nevada's veto on Yucca Mountain.

Mr. Niles noted that the Oregon Office of Energy contributed \$5,000 to the Oregon Museum of Science and Industry to improve the Hanford exhibit the museum is developing.

5. Plutonium Finishing Plant Negotiations

Mr. Dunning provided an update to the materials in the briefing notebook. He reported that the Tri-Parties completed their negotiations for new Tri-Party Agreement milestones for cleanup of the Plutonium Finishing Plant. The Tri-Parties seek public comments on proposed changes that identify work activities and the schedule. The public comment period is from June 17 through July 31, 2002.

6. Site Specific Solid Waste Environmental Impact Statement

Mr. Huston reported that the Oregon Office of Energy is reviewing and preparing comments on the Site Specific Solid Waste Environmental Impact Statement.

Public Comment

Mr. Beard asked for public comment and there was none.

JUNE 19, 2002

March Meeting Summary

Ms. Safford recapped the highlights from the March meeting and asked board members for their input on the meeting. Some of the significant points mentioned by several speakers included the ecological importance of the Hanford Reach, need for environmental monitoring and the fact that the irrigators most likely to be affected by real or perceived contamination from Hanford are Oregon irrigators.

Mr. Beard said the March meeting was right on target and complimented the speakers. Ms. Germond concurred.

Mr. Niles posted the potential recommendation subject areas described in a May 7, 2002 memorandum to the board. (See tab 5 of the meeting notebook.) He asked board members to keep the list in mind during the day and note items to add or delete.

Several attendees noted the low priority placed on groundwater. Ms. Germond said a comprehensive groundwater remediation plan is necessary.

Mr. Nisley asked about the possibility of Oregon becoming a member of the Tri-Party Agreement. Mr. Grainey responded that the Oregon Office of Energy proposed that Oregon be an advisory or "ex-officio" member of the Tri-Party Agreement. This status would allow Oregon to participate in Tri-Party Agreement negotiations, raise issues directly with the Tri-Parties and enter into a dialogue with the Tri-Parties to resolve issues.

Hanford Groundwater Remediation

Dennis Faulk discussed the U.S. Environmental Protection Agency's perspective on technical aspects of groundwater cleanup at Hanford. He identified the Hanford Site-Wide Groundwater Report as a valuable resource. (See tab 6 of the meeting notebook for a handout of his presentation slides.)

Mr. Faulk described the eleven groundwater operable units on site and the major contaminant plumes. Operable units are identified contaminated groundwater plumes, which are the focus of the U.S. Environmental Protection Agency's remediation work. There are five operable units in the 100 Area, four in the 200 Area, one in the 300 Area, and one in the 1100 Area.

Mr. Faulk said that the U.S. Environmental Protection Agency is not testing for tritium in each operable unit, because doing so requires too much water and the agency's priority is chromium. Mr. Dyer said there are technologies to test for tritium without much water and that it is critical that the U.S. Environmental Protection Agency and the U.S. Department of Energy test for tritium in all groundwater plumes.

Mr. Faulk said the U.S. Environmental Protection Agency's goal is to restore groundwater to its intended beneficial uses of protecting human health, the environment and the Columbia River. The challenge of groundwater cleanup is that aquifers are complex structures. Not all contaminants behave the same in groundwater. There is also a lack of information about all of the sites.

He described how several of the plumes are attenuating. The U.S. Environmental Protection Agency groundwater protection strategy includes: properly operating waste storage and disposal facilities; removing or immobilizing contaminant sources; reducing natural and artificial recharge in contaminated areas; and properly decommissioning wells that are no longer needed.

Mr. Faulk said the U.S. Environmental Protection Agency proposed the following actions for accelerated groundwater cleanup: solving the carbon tetrachloride, uranium and technetium problems in the 200 West Area and the strontium problem at N Springs; upgrading existing systems; and focusing on appropriate technologies. In response to a

question, Mr. Faulk said chromium is not part of the path forward because the U.S. Environmental Protection Agency believes an effective remediation system is in place.

Mr. Faulk said if the board agrees with the U.S. Environmental Protection Agency's approach, tell the U.S. Department of Energy to fund the work.

Mr. Lissner said if attenuation is by dispersion, the plume will get to the river. He asked whether there is agreement on a concentration limit or, if not, agreement with the concentration entering the river? Mr. Faulk said the releases to the river would significantly reduce over time. He added that the contaminants released into the river during operations were significantly higher than what is entering the river now and what is expected to enter the river in the future.

Dr. Mark Freshley, Pacific Northwest National Laboratory, discussed the U.S. Department of Energy's Science & Technology Program. Dr. Freshley is the manager of the program. The program originated from an effort to use scientific research from the U.S. Department of Energy's laboratories to improve the conceptual models at U.S. Department of Energy clean-up sites. The program identified data gaps, defined projects to investigate those gaps, and created a structure for research to inform remediation efforts and for remediation work to inform the research work. The objective is to inform and influence clean-up decisions. The program continues to evolve.

Early program work focused on investigating the inventory of contaminants released to groundwater. This involved models based on processing records and field investigations to confirm model predictions. It also involved field experiments to simulate waste leakage and tank leakage as well as contaminant uptake by biota. The results provided information for the System Assessment Capability and indirect input into tank farm characterization. Current field investigation work focuses on vadose zone infiltration.

The Science & Technology Program uses information developed by the Environmental Science Program, a nationwide U.S. Department of Energy program which provides money to researchers at national laboratories and universities to encourage them to investigate subjects that may advance cleanup. This work has a longer time horizon and involves more general subjects than Science & Technology Program work. Some of the cesium work from this program has benefited Hanford. Other projects involving technetium-99 in-situ monitoring may be informative.

The Tank Farm Vadose Zone Project is the core program of the Science & Technology Program right now. The U.S. Department of Energy knew tanks leaked and likely leaked into groundwater. The tank farm work involves investigating what happened in order to prevent it from happening again. The investigation revealed cesium deeper in the vadose zone than previously thought. The absence of vegetation in the tank farms may cause

more moisture to penetrate into the ground and drive contamination deeper. One solution to this problem being considered is installing interim covers over the tank farms to collect or divert precipitation. Another action would be eliminating leaking water lines.

Other field experiments revealed significant lateral movement of contaminants in the subsurface and the presence of clastic dikes. The lateral movement information is important for field characterization work. Also, the Office of River Protection used the information to help identify tank leak detection methods.

The plans for the tank farm project are being updated. Dr. Freshley said one of the big challenges is conducting science on a schedule. Scientists are unaccustomed to working on a schedule. Identifying key areas where the project can contribute is also a challenge. The Science & Technology Program made contributions to how to address chromium, uranium, strontium-90 and technetium. The program will be working to find and remediate the dense non-aqueous phase liquid carbon tetrachloride plume. It also will fill gaps in risk assessments.

Mr. Stoops asked whether information from the field investigations (i.e. seeing large impacts to sediments in areas thought to be isotropic) would be added to the fate and transport models. Dr. Freshley said they would.

Radiation Monitoring and Hanford Site Sampling Oversight

Ms. Debra McBaugh discussed the Washington Department of Health's Environmental Radiation Monitoring Program and the Quality Assurance Task Force of the Pacific Northwest.

The Washington Department of Health issues the site's air operating permits, conducts emergency response planning, and licenses and inspects non-federal facilities (such as the U.S. Ecology disposal site). The Department of Health is also responsible for environmental monitoring and assessment. It verifies the adequacy and accuracy of radiological programs conducted by the federal government or licensees. It established a statewide radiological baseline.

Ms. McBaugh discussed the objectives of the Department of Health's sampling program: oversight of sampling programs, sampling of areas with potential impact to public, (including groundwater) and assuring compliance with regulations (dose limits and air emission standards, cleanup verification sampling). The Department of Health samples air, water (surface water and groundwater), soil and biota (vegetation, aquatic and terrestrial, farm produce) and direct radiation exposure. Ms. McBaugh said a lot of ambient radiation is due to background radiation.

Ms. McBaugh's handout listed the samples collected by the Department of Health in 1998-1999 (See meeting notebook for a copy of the handout). The handout also showed all the monitoring wells on the Hanford Site. The Department of Health focuses on wells towards Richland plus a few for quality assurance. It is reviewing the program to determine if the right locations are being sampled. Ms. McBaugh also mentioned that the Department of Health samples the well at the Fast Flux Test Facility. Water from that well contains tritium, but at levels below drinking water standards.

Ms. McBaugh's handout included a comparison of sampling results to drinking water standards. The handout also showed tritium levels in wine from different areas. She explained, in response to a question, that Yakima area wine had lower levels of tritium, because the water used for irrigation is older and thus contains less atmospheric fallout and other contaminants. She showed a chart depicting radiation levels in Columbia River water samples. Nothing exceeded 12 percent of the drinking water standard. The materials also included results from sediment sampling for cesium-137, cobalt-60 and strontium-90. She said that in general the decreases result from deposition of clean sediment and radiological decay. McNary Dam is as far west as the Department of Health samples. In response to a question from Mr. Niles, Ms. McBaugh said that sampling downstream from McNary Dam would be useful, especially to verify a zero reading.

Ms. McBaugh briefly discussed the Quality Assurance Task Force of the Pacific Northwest. Its membership includes representatives of organizations that conduct radiation monitoring, the State of Washington and the State of Oregon (the Oregon Department of Health), affected tribal nations and a public representative. Its purpose is to verify the adequacy and accuracy of radiation monitoring programs in the state, enhance and maintain the credibility of the results and share information and lessons learned.

Ms. McBaugh said the lessons learned by the group include:

- Labs are able to analyze soil samples with a precision adequate for soil cleanup.
- Samples with concentrations far above normal analysis levels are problematic for some labs.
- There is variability in the thermoluminescence systems used in regional programs.

Ms. McBaugh distributed copies of the Department of Health's written comments on the most recent report from Norm Buske on the effects of contaminants in the Hanford Reach on the salmon redds. She distributed the Department of Health's 2002 master sampling schedule, a data report from the 2000 wildfire, a study of the N Springs and a brochure about contaminants near Hanford for 1998/1999. (See meeting notebook for copies of these materials.)

Mr. Beard called for public comment, but there was none.

Protecting the Columbia River: The National Perspective

Former Oregon Congresswoman Elizabeth Furse focused on three themes in her presentation: animals, treaty rights and how to focus national attention on Hanford. She said there is a pressing need for a comprehensive assessment of the hazards Hanford poses to animals, especially salmon. Individual studies (such as recent ones showing sex changes in Hanford Reach salmon) are important, but insufficient to understand the true impacts. The failure to examine systematically the impacts on animals and plants is a tragedy to the people of the Pacific Northwest.

Ms. Furse noted that the federal Constitution states that treaties are the supreme law of the land. Courts have interpreted treaties to protect the tribes' right to take fish. This right is a property right that extends to protecting the habitat (clean, cool water) that fish need to survive. The government cannot take a property right without providing compensation. Therefore, the federal government is creating a huge risk when it fails to protect fish. There is not enough money in the national or state treasury to compensate the tribes for their loss of this property right.

Ms. Furse noted the tribal participation in the Oregon Hanford Waste Board and laws passed by the Oregon Legislature that require state agencies to involve and consult with tribes. Consultation is costly, but the board should seek funding for tribal consultation.

Finally, Ms. Furse asked why Hanford, the protection of the Columbia River, protection of animals and treaty rights are not national interests? She asked attendees why preserving the Arctic National Wildlife Refuge generates national attention and support but protecting the Columbia River does not. She said the answer is that nobody is telling the story of the river and the people and wildlife that depend on it. She recommended hiring a public relations firm to launch the campaign and to base it on the stories of individual people. The story needs to be personalized in order for a nationwide audience to grasp it. She said she fully supports the board's work and would help move the issue forward.

Mr. Grainey thanked Ms. Furse for her efforts while in Congress to support Hanford cleanup and her continued support. He welcomed Ms. Furse's point that Hanford is a national problem and there is a need for work to get it recognized as such.

Ms. Jarvis noted the constantly changing U.S. Department of Energy managers and asked how to effectively seek funding or communicate with the Department of Energy when the managers keep changing. Ms. Furse said the funding for Homeland Security seems to be limitless and that Hanford is tied to Homeland Security.

Impacts of Hanford Contaminants

Dr. Eugene Foster of the Oregon Department of Environmental Quality provided an overview of how to conduct a risk assessment and then discussed a study of the effects of contaminants on Columbia River white sturgeon. A risk assessment involves defining the hazard, an exposure assessment and effects assessment, and then characterizing and managing the risk. He discussed briefly each of the components, which are described in more detail in his handout (see meeting notebook, tab 8).

The white sturgeon study detected DDE¹ at high concentrations as well as PCBs.² The results of the study pertain mostly to sturgeon longevity, but do provide indicators of what to study in other species. Ms. Jarvis asked whether the study included chromium. Mr. Foster said it did not. A study of chromium above Priest Rapids Dam is just beginning.

Dr. Amoret Bunn provided an overview of recent research on Hanford's potential impacts on the Columbia River. (See meeting notebook for a copy of her handout.) This included surveys of radiological contamination in the 100 N near-shore, chemical and radiological surveillance in the 300 Area, studies of hexavalent chromium's effect on salmon and uptake and elimination studies for risk assessments.

The 100 N survey showed external radiation levels two to three times background levels; estimated doses to people in the area engaged in typical activities below regulatory levels and estimated doses to aquatic biota below the U.S Department of Energy limit of 1 rad/day. The 300 Area surveillance results report should be finalized in September 2002. The hexavalent chromium study showed no apparent effects on the life stages included in the study (hatch to swimup). Ms. Bunn said she thought a Forest Service study examined effects at later life stages. The uptake and elimination studies are designed to provide information for risk assessments. The first studies focused on technetium-99. Preliminary results show the uptake rate is dose-dependent in trout and a type of algae and that organisms can regulate their uptake to some extent. The next study will look at strontium-90.

Ms. Jarvis asked how long a person would have to be in the 100 N Area to exceed acceptable regulatory levels. Dr. Bunn said 700 days. Mr. Faulk commented that the area is being cleaned up to 15 millirem/day. Dr. Bunn clarified that one of the typical activities examined was swimming and that there would be a skin effect. She also noted the high level of dilution caused by the volume of the Columbia River.

¹ 1,1-dichloro-2,2-bis(chlorophenyl) ethylene.

² Poly-chlorinated bi-phenyls.

Mr. Lissner noted that the graphs in Dr. Bunn's handout seem to indicate that mortality is related to temperature. Dr. Bunn said that could be true. She agreed with Mr. Lissner that mortality could also result from the presence of other contaminants.

Mr. Niles passed out a summary of the Columbia River Intertribal Fish Commission's recent study of the effects of fish consumption. He asked how to design a study to determine definitively whether chromium effects salmon. Dr. Bunn said it would be difficult to do.

The Regulators Plans for Protecting the Columbia River

1. Department of Ecology (Ecology)

Jane Hedges discussed the agency's priorities for protecting the Columbia River: tank waste retrieval, construction and operation of the vitrification plant, removal of spent fuel from the K Basins, cleanup of contaminated soils from the river corridor and Central Plateau, optimizing groundwater remediation activities, identifying and characterizing sources of vadose zone contamination and promoting new technologies for groundwater remediation.

Over 90 square miles of groundwater at Hanford are contaminated above drinking water levels. Ecology believes that groundwater remediation must be an integral part of source term removal, tank remediation and cleanup of past practice sites. There must be aggressive technology development, such as phytoremediation (using plants to uptake contaminants and thereby remove them from soil) and deployment. Additionally, risk assessments must include groundwater and the vadose zone. Groundwater should be treated as a valuable resource to be used for the greatest beneficial use.

In response to a question from the letter inviting Ecology to the meeting, Ms. Hedges said current groundwater remediation activities are Interim Actions and focus on ecological protection of the Columbia River. Riparian zones were not the focus of the initial remediation strategy due to complicated/complex hydrogeologic issues that were not clearly understood and treatment technology limitations. The principal contaminants of concern in the riparian zone are strontium-90 and chromium.

Ms. Hedges also responded to a question about the accelerated cleanup plan's assumption that groundwater use is precluded. She said the Washington Model Toxics Control Act (MTCA) requires clean-up levels to be based on highest beneficial use of groundwater. She said Ecology recognizes technical limitations when selecting remedies. Ecology views groundwater as a resource, not a sacrifice. Ecology supports the Future Site Uses Working Group and Ad Hoc Task Force recommendations for the Central Plateau being a

waste management area in the foreseeable future. Ecology's goal is to continue to shrink the area of groundwater and surface contamination in the Central Plateau.

She said that Ecology agrees with the board that well decommissioning should be a priority. The groundwater strategy being developed will include well decommissioning. This strategy will develop a priority ranking system for decommissioning wells based on the highest environmental risk. Decommissioning will be included in Central Plateau work plans.

Ms. Hedges said there is an increased need for additional wells for remediation, monitoring waste management facilities (RCRA), and sitewide surveillance. The new Resource Conservation and Recovery Act wells will be negotiated under a Tri-Party Agreement milestone. The strategy proposes coordination and prioritization of all well drilling to create a comprehensive well plan. The goal is to avoid duplication of monitoring and well drilling and provide the U.S. Department of Energy with clear direction of needed funding.

Ms. Hedges said the board can help Ecology by supporting: accelerated groundwater cleanup, additional investment in groundwater assessment and remediation, innovative technology development and deployment, applicable alternative methods for monitoring the vadose zone and continued interaction among board, Office of Energy, Ecology, Environmental Protection Agency, other stakeholders, and tribal nations.

2. U.S. Environmental Protection Agency

Mike Gearheard said there is a need to spend wisely. Hanford is a place where wasting money happens. The Hanford budget is larger than the entire national Superfund program. He said he did not like to see so many resources devoted to one site. There is a shared responsibility to spend money effectively.

Mr. Gearheard quoted from the Environmental Protection Agency's regulations to describe its cleanup goal for groundwater at Superfund sites: "Return usable groundwaters to their beneficial uses, wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site." (40 CFR 300.430)

He discussed the meaning of usable groundwater. Groundwater is not usable if it has high levels of natural salinity. Groundwater is not usable if it cannot be removed from the ground (e.g., 150 gallons/day).

Every state sets its own beneficial uses. Washington has not done much of that. The assumption is that the beneficial use is drinking water if it can be used for that. Hanford groundwater also supplies return water to the Columbia.

Where practicable is also important language in the regulation. The general approach in Superfund is throughout the plume. But there are many circumstances where that is not practicable. A circle might be drawn around a series of waste areas and a decision made to protect at that edge. At one time, the Department of Energy might have wanted the Environmental Protection Agency to draw that line at the Columbia River. There is a constant tug of war - pushing back and forth - as to where that point of compliance should be.

The timeframe that is reasonable is defined very loosely. Institutional controls and natural attenuation are used to protect people from the wastes. That is a way of flexing the timeframe.

There are difficult judgement calls at Hanford. The groundwater is usable. The beneficial uses are drinking water and protecting the Columbia River. Today river protection is a higher priority.

The cleanup goals for groundwater are maximum contaminant levels. In the absence of a maximum contaminant level, there may be a maximum contaminant level goal. Or, there might be ARARs (applicable or relevant and appropriate regulations), such as levels in the river to protect fish, that can be used to set levels. If not those, then the level is set at a 10^{-4} risk.³ The State of Washington's level is 10^{-5} . The Environmental Protection Agency has a little more flexibility.

Over the next several years, the work will proceed to set the uses. Mr. Gearheard said his quote in the *Seattle Post Intelligencer* regarding not having their act together about groundwater at Hanford referred to tritium and a lack of long-term planning for groundwater. There is always a balance between the scientists who can never get enough information and bureaucrats who have enough information before the research begins. The tradeoffs between getting more data and doing work will continue. Mr. Gearheard said he believes there is enough information and need to proceed with cleanup now. He emphasized the importance of understanding likely future risk scenarios.

There has not been an emphasis on source control. It is one thing to worry about compliance points and exposures scenarios. The sources need to be stopped so things do not get worse. The massive liquid discharges have stopped. The largest sources, chromium, technetium, and uranium have been targeted. There is still work to be done, such as the tanks and the 618-11 Burial Ground.

³ These levels are expressions of the risk of developing cancer during a person's lifetime. The notation 10^{-4} means that there is estimated to be one chance in ten thousand (or one ten thousandth of a chance) that any single exposed individual will develop a fatal cancer in his or her lifetime.

If groundwater restoration is not practicable, pumping contains the plume. Natural attenuation or institutional controls may also be options as are a technical practicability waiver or alternate concentration limit. Region X has never allowed such a waiver or alternate concentration limit. Additionally, the Environmental Protection Agency strongly resists solutions at one site being promoted at another site unless the facts are the same. Otherwise businesses advocate the lowest common denominator every time.

The Environmental Protection Agency's Records of Decision are designed to protect the river. The systems for treating chromium and strontium 90 are being re-examined. Natural attenuation is not doing well for addressing uranium in the 300 Area.

Mr. Gearheard said Hanford's budget is huge and Hanford has never missed a milestone or held up a milestone because of budget constraints. The board's help is necessary to continue to secure the funds needed for cleanup. Mr. Gearheard urged the board to make sure there is adequate funding for the accelerated cleanup plan.

Mr. Lissner noted a lot of discussion about land disposition at Hanford. He questioned whether the federal government can give up contaminated land. Mr. Gearheard replied that it happens all the time through programs like the Base Realignment and Closure Act program. The federal government understands that it is fully responsible for the problems at Hanford. Ms. Jarvis said the Department of Energy does not always act like it is aware of that.

Mr. Beard called for public comment, but there was none.

Mr. Niles led a short review and discussion of the recommendation areas that were posted early in the day.

Mr. Lissner said the board should address the issue of how clean is clean and make a recommendation to the Environmental Protection Agency. He said questions are partly technical and partly political. Mr. Niles reminded the board of its goal of developing draft recommendations by September to develop into final recommendations by December. Mr. Huston said the issue could be addressed in 2003. Mr. Repasky noted that the Confederated Tribes of the Umatilla Indian Reservation have requested that the Department of Energy use Native American scenarios at all locations, and particularly along the river. Those scenarios require standards that are cleaner than residential and industrial levels.

Mr. Nisley said the discussion was far afield of the board's already agreed upon objectives. Ms. Jarvis agreed. She said clean-up standards are a project for next year. It would be too difficult to make recommendations on them to the governor by December.

Mr. Beard asked about an increased role for Oregon. Mr. Niles said the State of Oregon has worked hard for some time to try to get such a role and that effort has some baggage attached to it. He was reluctant to have that issue color and possibly cause other recommendations to be discounted or ignored. Ms. Germond agreed.

Mr. Niles said Mr. Faulk talked about a burial ground near the K Reactor that is a source of tritium and accelerating cleanup. He suggested including a recommendation regarding cleanup of that specific site.

Ms. Jarvis said her comments are based on her experience on another advisory board, which made recommendations to the governor to keep focus. The recommendations were made effective through a personal presentation to the governor. That type of presentation means the recommendations should be limited in number and very succinct.

Mr. Dyer said there should be two types of advice: advice to the governor for his action and advice to the governor to send to others for action.

The board added implementation to the list of items regarding a groundwater cleanup plan.

Mr. Niles emphasized the need for board feedback and input well before the next meeting.

Mr. Niles said the board could advocate research to better understand the cumulative impacts and the need to analyze cumulative impacts.

Ms. Safford noted that the September meeting is scheduled for September 24-25 in Boardman.

The meeting adjourned at approximately 4:45 p.m.