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# **ERC Team**

## **Meeting Minutes**

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**SUBJECT** GROUNDWATER/VADOSE ZONE INTEGRATION OPEN PROJECT MEETING -  
AUGUST 16, 1999

**TO** Distribution

**FROM** Michael J. Graham, Groundwater/Vadose Zone Integration Project Manager

**DATE** September 14, 1999

**ATTENDEES**

See Attached List

**DISTRIBUTION**

Attendees  
GW/VZ Distribution List  
Document and Information Services H0-09

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**NEXT GW/VZ INTEGRATION PROJECT OPEN MEETING:**

Next Meeting: Monday, September 20, 1999 – 1-3 p.m.  
Location: Bechtel Hanford, Inc., Assembly Room (Badging Required)  
Local Call-In Number: (509) 376-7411  
Toll Free Call-In Number: (800) 664-0771

**MEETING MINUTES:**

A Groundwater/Vadose Zone (GW/VZ) Integration Project Open Meeting was held on August 16, 1999 in Richland, Washington, at the Bechtel Hanford, Inc. (BHI) Assembly Room.

**PROJECT OVERVIEW/STATUS (Michael Graham):**

Last week, we participated in a regulatory reviews of the Detailed Work Plan (DWP) for Fiscal Years 2000-2002 (FY00-02). There were also a few stakeholders that participated in that review. Rich Holten and I would like to solicit feedback on that. Ecology was unable to attend the GW/VZ Integration Project portion of the review, but we're meeting with them this Wednesday to get their comments. For those of you here that attended that review, do you have any further questions or comments?

**RESPONSE:** I (Gordon Rogers) am trying to complete my comments, and I know that Wade Riggsbee has some thoughts. I also think the Shelly Cimon and Greg deBruler intend to submit something.

**COMMENT:** Please try to have those comments in by this Thursday. We're beginning to wind up the process and need to have time to incorporate anything before we go into production.

**SYSTEM ASSESSMENT CAPABILITY WORK GROUP (Bob Bryce):**

Last Tuesday (August 10) we held a System Assessment Capability (SAC) Work Group meeting on risk conceptual models. I thought there were good discussions on the human health, cultural, and economic risk metrics being considered for inclusion in the Rev. 0 SAC. We spent most of the time on the cultural and

economic metrics since the others are a little more defined. We're also looking for feedback on that meeting. We know that some people filled out issue forms, but we haven't received any of those. We'd like to get those back as soon as possible. We just want to hear from folks.

There is a SAC Work Group Meeting on SAC Rev. 0 conceptual model implementation planned for August 25. We'll discuss the approach to developing the Rev. 0 capability and how it will ultimately be used as a basis for the decision-making capability. Since we've spent the last few Work Group meetings discussing the conceptual models in general, now we can talk about what will be implemented in Rev. 0. This is yet another chance to hear feedback on the issues that we've been discussing over the last couple of months.

We've set up the agenda like this. We've set aside a small block of time at the beginning of the meeting to discuss the purpose of the meeting and cover a few ground rules to help make the meeting more productive. We will define the purpose and scope of the SAC Rev. 0 so that the discussions can be held within that framework. We'll discuss the relationships between the various technical elements. We'll define what is planned to be included in the SAC Rev. 0. We'll also discuss what is not going to be included in Rev. 0 and the potential impacts associated with that.

After a break, we'll discuss the various implementation options. The design/build/operate approach was something that we touched on in the DWP. Another possibility is an incremental design approach. We need to discuss this with the regulators and stakeholders in order to get their input for what is important to them. This meeting should help us to move forward.

After lunch, the technical leads for the various elements will cover the conceptual models for their pieces, present the options that have been discussed, and give their recommendations on models.

QUESTION: As the conceptual models have evolved, there have been issues raised. Where are those?

ANSWER: The ones we can address now, we will roll into Rev. 0. We've identified an issues tracking process to tackle the things we can't do now. If it is a technical issue, then it feeds into the features, events, and processes (FEPs) system.

COMMENT: There are some issues that should be priorities in Rev. 0.

RESPONSE: We've been putting issues into a spreadsheet. We'll hand that out at the August 25 meeting and get input on it.

COMMENT: This will be a benchmark for all other projects.

RESPONSE: It's a tool that will help us learn how to move forward, but it doesn't benchmark everything. It will give us a better look at how we should approach Rev. 1.

COMMENT: It's really important that people understand the projected purpose of the Rev. 0 SAC. This is to be a starting point. We'll throw in particular scenarios after it's built. It's not a ratcheted system. It's not something that locks you into a certain path. The idea that some people look at this as an "end-all" answer, or that anything it produces will be etched in stone, scares me.

COMMENT: I'm hearing that from a number of places. It needs to be clear that this is not an assessment to crank out numbers and spreadsheets, but rather it's a tool that lets us approach and test ideas for further revisions. This first cut should be a learning tool and help identify uncertainty.

COMMENT: I think that most people understand that.

COMMENT: The concept for the SAC Rev. 0 was to reach out broadly and then narrow the focus for future revisions. The fact that there are already some pieces being "put off until later" bothers me.

RESPONSE: There has been a lot of input as to what is important. What people really seem to want is a river assessment and a study of contaminant movement through Hanford's groundwater and vadose zone. Based on this, we've recommended choices for things that could be put off until later, such as atmospheric transport. That way we can focus on the river and other things we hear are important in the first assessment. Dirk Dunning expressed a concern during the DWP meeting that the assessment scope has narrowed too quickly already to a set of "important" contaminants. The fact is that we need to start with what is perceived as important, and then spread out from that hub. It would be too broad, costly, and take too long to build to be practical if everything under the sun was included right off the bat. We need to start with something that's buildable in a reasonable time for a reasonable amount of money that shows a robust inventory. If something is not included in the initial assessments, it definitely does not mean that it's never going to be considered. We just need a foundation to build upon.

COMMENT: From looking at the agenda for the meeting, it seems a little optimistic to schedule only a half-hour for each of the conceptual models.

RESPONSE: The SAC Work Group has held meetings on these models and spent half a day discussing each. Half an hour should be enough time to recap what was discussed and present how we plan to implement them in the SAC Rev. 0. Release might take a little more time, but it shouldn't be a problem. We're in the process of putting some tables together so that people can have something in front of them to help focus the conversation. We hope to have those done by the end of the week and out to the members of the SAC Work Group before the meeting.

SCIENCE AND TECHNOLOGY (Terri Stewart):

We're working on preparations for Risk Science and Technology (S&T) Workshops involving the National Labs. The tentative working dates are October 4-7 and September 7-8. We should have those dates confirmed in about a week. We're working with the technical leads from offsite to confirm their availability. We'll get the workshops listed on the Project calendar when everything is confirmed. (NOTE: October 5-6 and November 9-10 are the actual confirmed dates due to participant availability. An invitation and registration form are attached as Attachment 1.)

We're trying to apply lessons learned from last summer's S&T Workshops. We're going to try to prepare materials in advance and pre-brief the people that will be participating from off-site. We're also going to engage the users in effective way, with the SAC being a primary user. We'll need to get input from

Amoret Bunn and Pam Doctor who are working on the SAC risk element. We want to make sure that the regulators know what the preparatory materials look like and get input. We will attach what materials we'd like input on to this meeting's minutes when they go out (Attachment 2).

There are certain questions that need to be answered. Is this item important to the SAC, and if it is can it be done now? If no, then what S&T needs are there? If yes, then how can it be done? Does it have a process to cover uncertainty? If no, what are the S&T needs there? We need to get things laid out and ask those kinds of questions.

I'd also like to give an update on the status of the Natural and Accelerated Bio-Remediation (NABIR) Field Research Center. Most of you are aware that the site has made a proposal to use the 100-H Area for the field research center. This is sponsored by the Department of Energy (DOE) Office of Science and would mean about \$3 million per year for the site over and above the normal site budget in order to explore bio-remediation options for chromium and technetium.

Basically, Hanford is competing against Oak Ridge National Lab to be awarded the field research center. The peer review at DOE Headquarters (HQ) is complete, and the next phase is a site visit on September 7. We'll be ready to present the advantages of having the center located at Hanford. There has been strong stakeholder, regulator, and Tribal support, and that has been appreciated. As always, continued input is appreciated as well.

QUESTION: Who is performing the review?

ANSWER: The panel is comprised mainly of university and DOE people. The site visit will not be the full peer review panel.

QUESTION: If Oak Ridge gets the contract, will they still be looking at Hanford issues?

ANSWER: They should be, but I'm not fully up on their proposal. Whoever gets the NABIR Center will be expected to not only work on issues applicable to their specific site, but also for the various DOE sites nationwide. That is a point that we are trying to get through to the review panel. The research that could be accomplished at Hanford would have a greater relevance to the other DOE sites than research done at of Oak Ridge. We will try to plant that seed in the minds of the panel.

COMMENT: If you need the information, it shouldn't matter too much where it comes from as long as it's good, legitimate information.

COMMENT: Rumor has it that there are discussions going on about the possibility of splitting the award down the middle. That doesn't seem like such a grand idea. If that does happen, we're asking that the split be in time and not in dollars. That way whatever research needing to be done would be fully funded at both sites, but for only half of the time proposed. It seems a better option than two organizations doing similar things with half the dollars. Originally they had the idea of three to four different centers at various locations.

COMMENT: If the SAC had a module defined that could be given to Oak Ridge, then they could go on that.

RESPONSE: The problem is the different geology there. How do you get information on technetium in the vadose zone in a place where you have a very different vadose zone?

COMMENT: There would be direct impacts and direct benefits if the center comes here.

QUESTION: Does this start in 2000?

ANSWER: Yes. An announcement about the location is expected in the October timeframe. An announcement can't be made until there is closure on the environmental assessment. There should be a draft work scope made available to all, with an opportunity to comment.

REGULATORY PATH FORWARD WORK GROUP (Moses Jarayssi):

This is just a brief notice, and more importantly an invitation, to the upcoming Regulatory Path Forward Work Group meeting scheduled for August 26. It will really be more of a planing meeting than a discussion of any technical issues. I would like the group to come to an agreement and give advice on the products that should come out of the group. How should they be shaped? How should they be built? I know that the SAC is looking for specific items. If you can attend, please do.

GW/VZ EXPERT PANEL (Virginia Rohay):

The next meeting of the GW/VZ Expert Panel will be held on September 15-17. This will be the last Open Project Meeting before that date, so I wanted to make sure that something was said about the Expert Panel meeting. We are still discussing the draft agenda with the Panel chairman, Dr. Edgar Berkey. We hope to have it available to attach to the minutes for this meeting (Attachment 3).

GW/VZ INTEGRATION PROJECT PICNIC (Dru Butler):

We are planning a picnic for the friends of the GW/VZ Integration Project on the afternoon of September 17 following the conclusion of the Expert Panel meeting. It's just to wish everyone a happy new year and to celebrate making it most of the way through FY99. People have been working hard on the DWP and deserve a break. Since we don't want to risk poisoning anyone, we are having the picnic catered. Karen Strickland has the details, and we will be sending out a notice with the particulars. We'll need to know who is planning to attend so that we can give the caterer a head count. (The picnic will be at approximately 12:30 p.m. depending on what time the Expert Panel concludes. It will be held at Leslie Grove #1 in Richland. Please contact Karen Strickland at 509-372-9192 for details.)

OFFICE OF RIVER PROTECTION/PROJECT HANFORD MANAGEMENT CONTRACTOR UPDATE (John Williams):

We've completed the decommissioning of the 41-09-39 borehole. 15 out of 16 horizons were successfully sampled. The one that was missed due to the problems encountered with removing the casing. We're in the process of lab analysis, and we anticipate good data from that.

We commenced drilling the new well by SX-115. We've got the first couple of sample already, and the hope is to be done this fiscal year with the lab work continuing into FY00.

ECOLOGY ANNOUNCEMENT (Dib Goswami):

Ecology has invited Norm Buskee to give a presentation on August 19 to regulators, Oregon, and the Washington Department of Health. This meeting will not be open to the general public, but you will likely

hear about outcomes from the meeting. It should be similar to the presentation he gave following the July 15 Hanford Advisory Board (HAB) meeting. This will just give us an opportunity to interact with him directly.

QUESTION: Will this be on strontium 90?

ANSWER: That's likely, but it will also cover anything else he wants to talk about.

**UPCOMING EVENTS AND OPPORTUNITIES FOR PARTICIPATION:**

(See attached Look Ahead Calendar)

**NOTES:**

GW/VZ Web Site location: <http://www.bhi-erc.com/vadose>

If you have questions or comments please contact Dru Butler (509-375-4669), Gary Jewell (509-372-9192), or Karen Strickland (509-372-9236)

**ATTACHMENTS:**

- 1) Risk S&T National Labs Workshop Invitation and Registration Form
- 2) Risk S&T National Labs Workshop Planning Sheets
- 3) Draft Agenda for September 15-17 GW/VZ Expert Panel Meeting
- 4) GW/VZ Integration Project Two Month Look Ahead Calendar

**ATTENDEES:**

Julie Atwood – BHI

Martin Bensky – Tri-Cities Caucus

Bob Boutin – BHI

Bob Bryce – PNNL

Amoret Bunn – PNNL

Don Clark – JAI Corp.

Mike deLamare – BHI

Michael Graham – BHI

Dib Goswami – Ecology

Jim Hanson – DOE-RL

Mary Harmon – DOE-HQ

Rich Holten – DOE-RL

Moses Jarayssi – BHI

Phil Long – PNNL

Katy Makeig – SMS

Fred Mann – FDNW

Wade Riggsbee – Yakama Nation

Gordon Rogers – Tri-Cities Caucus

Virginia Rohay – CHI

Stan Sobczyk – Nez Perce Tribe

Terri Stewart – PNNL

Mike Thompson – DOE-RL

John Williams – FDH

Rob Yasek – DOE-RL

## ATTACHMENT 1

### **Risk S&T National Labs Workshop Invitation and Registration Form**

Dear Colleague:

You are cordially invited to attend the Risk Science and Technology National Workshops in Richland, Washington on October 5 and 6, 1999 and November 9 and 10, 1999. These workshops are being sponsored by the Hanford Site Groundwater/Vadose Zone Integration Project, but have application to national-level programs as discussed below. Information about the itinerary, project, and scope of the National Workshop effort is provided below. Additional information can be located at <http://www.bhi-erc.com/vadose/s&t.htm>.

The Risk Science and Technology National Workshops are being conducted to identify science and technology needs that, if filled, would improve the ability to assess risks from contaminants that enter the Columbia River through groundwater at the U.S. Department of Energy's Hanford Site. The workshops will focus on four risk areas: human health risks, ecological risks, economic risks, and socio-cultural risks. Participants in the workshops will work to identify key technical issues and gaps in risk data or methodologies. They will also define key science and technology activities that could resolve the issues and data gaps. Both workshops will be open for stakeholder, tribal, regulator, and community participation. Please forward this invitation on to those who are interested in these fields.

For information about the Risk Science and Technology National Workshops please contact Gordon Bilyard ([gordon.bilyard@pnl.gov](mailto:gordon.bilyard@pnl.gov); 509/372-4219). To register for the workshops (note, there is no fee for this workshop), please complete and return the attached form to Gordon electronically or by fax (509/372-4995). Space is limited, and will be assigned on a first-come, first-served basis. Registrants will be sent further information about the workshops during the week of September 20. This information will include an initial compilation of risk S&T needs identified by Hanford Site staff, and initial thoughts on potential elements of both national-level and Hanford-level Risk Science and Technology programs.

Gordon Bilyard  
Pacific Northwest National Laboratory  
P.O. Box 999, K8-03  
Richland, Washington 99352  
Phone: 509/372-4219  
Fax: 509/372-4995

Dates, Times, and Locations for the S&T National Workshops

**S&T National Workshop #1**

Tuesday, October 5

Workshop - 8:00-5:00 at the Doubletree Hanford House, Richland, Washington

Wednesday, October 6

Workshop - 8:00-5:00 at the Doubletree Hanford House, Richland, Washington

**S&T National Workshop #2**

Tuesday, November 9

Workshop - 8:00-5:00 at the Doubletree Hanford House, Richland, Washington

Wednesday, November 10

Workshop - 8:00-5:00 at the Doubletree Hanford House, Richland, Washington

**Background Information**

Groundwater/Vadose Zone Integration Project

The Hanford Site Groundwater/Vadose Zone (GW/VZ) Integration Project (Integration Project) was initiated in 1997. A key project objective is to develop the technical capability and scientific information basis needed to assess the risks and impacts of Hanford Site operations on the Columbia River and river-supported systems, including waste disposal, remediation, and site closure. More specifically, the risk assessment methodologies, computer models, and data developed by the project will help inform and influence key decisions by regulators and U.S. Department of Energy (DOE) on the selection of clean-up goals and technologies (DOE 1999).

The Integration Project is focused on five endeavors that reflect the concerns and recommendations of the Department of Energy, stakeholders, and the general public:

- Integrate characterization and assessment work affecting long-term risk assessments (Integration).
- Assess the potential cumulative effects of Hanford Site contaminants (System Assessment Capability or SAC)
- Enhance the role of science and technology as the basis for cleanup decisions (Science and Technology).
- Ensure productive involvement by parties interested in affecting Hanford's cleanup (Public Involvement).
- Ensure technical reviews and management oversight to optimize cleanup and protection of water resources.

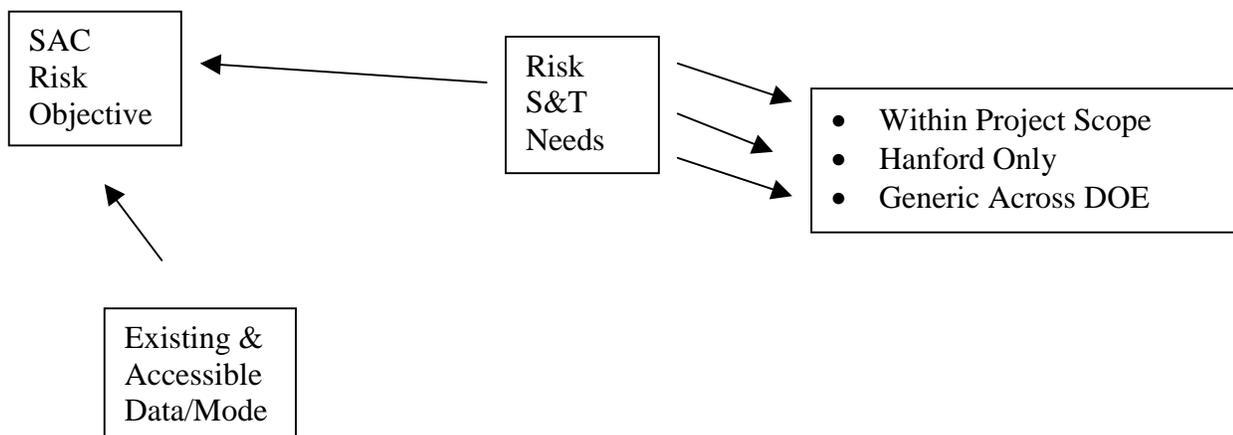
Science and Technology Endeavor

The main emphasis of the Science and Technology (S&T) endeavor is to provide the knowledge, data, tools and understanding that are needed to enable the Integration Project’s mission. S&T is focused on resolving the key technical issues that are associated with Hanford ground water and/or vadose zone, and that impede the ability to make informed decisions within the Groundwater/Vadose Zone Integration Project and other Hanford Site projects. The scope of the S&T program currently encompassed four technical areas (technical elements): chemical and radioactive inventories, vadose zone, groundwater, and Columbia River. In FY00, the program will incorporate a fifth technical element - risk.

The S&T endeavor brings together problem holders (e.g., DOE, Tribal Nations, regulators, stakeholders), cleanup contractors, and problem solvers (e.g., scientists and engineers from national laboratories and universities) for the purposes of:

- Defining problems;
- Identifying potential solutions; and
- Identifying specific areas where S&T can be applied to enable the best possible solution (DOE 1999).

The figure below helps to describe how the Risk S&T endeavor supports the risk objectives of the Integration Program’s System Assessment Capability (SAC). Existing and accessible data and models provide much of what is needed to achieve SAC Risk Objectives. However, gaps exist in these data and models, and even where data and models exist, they are not always adequate to characterize risk within acceptable limits of accuracy and precision. Identifying the gaps, identifying areas where accuracy and precision need to be improved, and creating paths forward to fill both types of needs is the scope of the Risk S&T endeavor.



Hanford Site staff have drafted a preliminary set of site-specific needs that include recommended paths forward. This set of needs necessarily reflects regional and local concerns about ground water and the vadose zone on the Hanford Site. The task of the S&T National Workshop will be to identify a similar set of needs (including paths forward) for the DOE complex nationwide in the same four risk areas: human health, ecological resources, socio-cultural resources, and economics. (Participants in the national level

workshops will be provided with Hanford-specific needs and paths forward as part of the pre-workshop briefing materials.) Hanford-specific needs and complex-wide needs will be submitted to DOE-HQ as input to the call for proposals under the Environmental Management Science Program (EMSP). In addition, it is anticipated that proposals to fill needs at both levels could also be prepared for submission to other funding agencies (e.g., EPA, NSF, NIH).

**Reference:**

DOE-RL, 1999. *Groundwater/Vadose Zone Integration Project Summary Description*, DOE/RL-98-48, Vol.1, Rev.0. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Registration Form

Name: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_

Fax No.: \_\_\_\_\_

Email: \_\_\_\_\_

Risk Expertise:

*(Please indicate expertise/interest in priority order for all that apply. For example, if your primarily risk assessment expertise is in human health risk but you also have expertise and experience in ecological risk assessment, mark human health risk as number 1 and ecological risk as number 2.)*

Human Health \_\_\_\_\_

Ecological \_\_\_\_\_

Economic \_\_\_\_\_

Socio-cultural \_\_\_\_\_

Other \_\_\_\_\_ Please describe:

*Please email this form to [Gordon.Bilyard@pnl.gov](mailto:Gordon.Bilyard@pnl.gov) or fax it to same at 509/372-4995.*

## Attachment 2

### Risk S&T National Labs Workshop Planning Sheets

The following are tables that are being filled in during the process of planning for the Risk Science and Technology Roadmap Workshops. These tables will become background information for the participants at the workshops. These workshops are being held during the first week of October and the second week of November. The results of these workshops will be information for the Groundwater/Vadose Zone Integration Project's Science and Technology Roadmap.

The basic question to be addressed during the Science and Technology Roadmap Workshops is, "what levels of radionuclides and chemicals produce unacceptable impacts on receptors?" Impacts are defined as adverse effects or changes. Receptors are human beings or other species living in the study area (from the Hanford Reach to the Pacific Ocean).

The tables identify issues, the status (or current approach), the need for further research, actions to address the research needs (e.g., perform laboratory experiments, environmental characterization), and where to address the needs (e.g., an activity by a Hanford core project, or a program like EMSP). Tables 1 and 2 are for the human health and ecological science and technology needs. Table 1 identifies issues associated with receptor's response to contaminants. Table 2 identifies issues associated with exposure pathways to receptors. Table 3 is for economic science and technology needs. Table 4 is for socio-cultural science and technology needs.

The information collected in the tables will be provided to the participants of the Science and Technology Roadmap Workshops as part of the background information. If you would like to fill out the tables, please provide your input to Gordon Bilyard ([gordon.bilyard@pnl.gov](mailto:gordon.bilyard@pnl.gov); 509-372-4219). Gordon will need this information by September 30 if it is to be included in the background information for the workshop participants.

**Table 1: Eco-Human Receptor Response**

<b>Risk Element</b>	Endpoints – Cancer slopefactor (direct)	Endpoints - Noncancer - tox by mode of action (direct)	Endpoints - Noncancer - Probability Distributions (direct)
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Endpoints - predation risk as affected by behavior (indirect)	Endpoints - multigeneration - human	Endpoints - individual-population-comm-ecosys (translation to other endpoints)
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Contaminant Interactions - dealing with multiple contaminants, e.g., by mode of action	Spaciotemporal variation in exposure - integrating actual exposure and comparing to steady-state benchmarks	Spaciotemporal variation in exposure - effects of exposure history (prior)
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

**Table 1: Eco-Human Receptor Response (continued)**

<b>Risk Element</b>	Adaptive Responses - Evolutionary change	Adaptive Responses - Metabolism of contaminants and toxicity of residuals	Adaptive Responses - Storage of contaminants
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Adaptive Responses - Modifying excretory rates	Individual Variation - Age/sex/genotype/nutrition/stress effects	Taxonomic extrapolations of response - methodology options
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Toxicity extrapolations - acute/chronic and environmental exposure	Pathway Integration - addressing simultaneous effects of dermal, ingestion, inhalation interaction	Pathway Integration - weighted summation of organ-specific dose
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

**Table 2: Eco-Human Exposure**

<b>Risk Element</b>	Exposure routes - Scenarios for specific groups (gw-soil-plants-pollen-air-inhal.)	Exposure routes - Compensatory uptake, e.g., responses to high environmental concentrations and multiple exposure routes (nonlinear responses)	Spatiotemporal variation in environments - e.g., seasonality, water level fluctuations, weather patterns (El Niño), climate change
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Spatiotemporal variation in lifestyles - e.g., migration	Spatiotemporal variation in daily routine - e.g., home range	Spatiotemporal variation in contaminant concentrations
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Spatiotemporal trends in receptors – e.g., long-term trends in pops and communities	Modeling Framework – time period for integrating exposure	Modeling Framework – extrapolating parameters from other species
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

**Table 2: Eco-Human Exposure (continued)**

<b>Risk Element</b>	Modifiers to exposure - e.g., bioavailability, particulate vs. dissolved, organic complexes	Modifiers to exposure - environmental conditions, e.g., competing ions, hardness, temperature, pH	Modifiers to exposure - dietary sorbants
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Modifiers to exposure – effects of competition for limited contaminated resources	Modifiers to exposure – relative use of groundwater vs. soil water by deep-rooted vegetation	Interindividual variation – age/nutrition/stress/sex
<b>Status</b>			
<b>Need</b>			
<b>Actions</b>			
<b>Where to Address</b>			

<b>Risk Element</b>	Interindividual variation - variations within a lifestyle
<b>Status</b>	
<b>Need</b>	
<b>Actions</b>	
<b>Where to Address</b>	

**Table 3: Economics**

<b>Risk Element</b>	Recreational Fisheries
<b>Status</b>	
<b>Need</b>	
<b>Actions</b>	
<b>Where to Address</b>	

**Table 4: Socio-Cultural**

<b>Risk Element</b>	Aesthetics	Historical
<b>Status</b>		
<b>Need</b>		
<b>Actions</b>		
<b>Where to Address</b>		

**Attachment 3  
- DRAFT AGENDA -**

***Groundwater/Vadose Zone Integration Project September 15-17, 1999 Expert Panel Meeting***

**BECHTEL BUILDING ASSEMBLY ROOM**

**WEDNESDAY, September 15**

**Moderator**

<b>8:30 – 9:00 am</b>	<b>On Your Own Coffee From Columbia River Deli</b>	
<b>9:00 – 9:15 am</b>	<b>Welcome and Introduction Expert Panel Meeting Protocols</b>	E Berkey
<b>9:15 – 9:30 am</b>	<b>Opening Statement</b>	K Klein
<b>9:30 – 10:45 am</b>	<b>Groundwater/Vadose Zone Integration Project Fiscal Year 2000 Organization, Plans, and Schedule</b>	R Holten, M Graham, T Stewart, J Williams
<b>10:45 – 11:00 am</b>	<b>Break</b>	
	<b>Groundwater/Vadose Zone Integration Project Accomplishments and Status</b>	
<b>11:00 – 12:00 noon</b>	• <i>System Assessment Capability</i>	R Bryce
<b>12:00 – 12:45 pm</b>	<b>Lunch - Box Lunches Available at Cost (E. Moniz and C. Huntoon Arrive at 12:45 pm)</b>	
<b>12:45 – 1:20 pm</b>	<b>Welcome and Introduction Opening Statements</b>	E Berkey, K Klein, E Moniz, C Huntoon
	<b>Groundwater/Vadose Zone Integration Project Accomplishments and Status (Continued)</b>	
<b>1:20 – 1:30 pm</b>	• <i>Management and Integration</i>	R Holten, M Graham
<b>1:30 – 2:30 pm</b>	• <i>Science &amp; Technology</i>	T Stewart
<b>2:30 – 2:45 pm</b>	<b>Break (E. Moniz and C. Huntoon Depart at 2:30)</b>	
<b>2:45 – 3:45 pm</b>	• <i>Vadose Zone Characterization (field studies)</i> 200 Area Assessments River Protection Program	B Ford, A Knepp
<b>3:45 – 4:45 pm</b>	<b>Opportunity for Stakeholder, Tribal Nation, and Regulator Input and Comments</b>	E Berkey
<b>Evening</b>	<b>Panel Only: Working Session #1</b>	

**- DRAFT AGENDA -**

***Groundwater/Vadose Zone Integration Project September 15-17, 1999 Expert Panel Meeting***

**BECHTEL BUILDING ASSEMBLY ROOM**

**THURSDAY, September 16**

**Moderator**

**8:00 – 12:00 noon      Panel Only: Working Session #2**

**12:00 – 2:00 pm      Program Management/System Assessment  
Capability: Discussion/Dialogue of FY 2000 Plans  
and Products**

**2:00 – 2:15 pm      Break**

**2:15 – 4:15 pm      Characterization of the System:  
Discussion/Dialogue of FY 2000 Plans and Products**

**4:30 – 5:30 pm      Panel Only: Working Session #3**

**Evening              Panel Only: Working Session #4**

**- DRAFT AGENDA -**

***Groundwater/Vadose Zone Integration Project September 15-17, 1999 Expert Panel Meeting***

**BECHTEL BUILDING ASSEMBLY ROOM**

**FRIDAY, September 17**

		<b><u>Moderator</u></b>
<b>7:30 – 8:00 am</b>	<b>On Your Own Coffee From Columbia River Deli</b>	
<b>8:00 – 8:30 am</b>	Expert Panel Report from Chicago Working Session <ul style="list-style-type: none"><li>• <i>Subpanel Working Procedures</i></li></ul>	E. Berkey
	<b>Expert Panel Plans</b>	E Berkey
<b>8:30 – 9:00 am</b>	• <i>Program Management issues</i>	
<b>9:00 – 9:30 am</b>	• <i>Characterization of the System issues</i>	
<b>9:30 – 10:00 am</b>	• <i>Subsurface Investigations issues</i>	
<b>10:00 – 10:30 am</b>	• <i>Modeling issues</i>	
<b>10:30 – 10:45 am</b>	<b>Break</b>	
<b>10:45 – 11:30 am</b>	<b>Comments from the Panel</b>	E Berkey
<b>11:30 – 12:00 noon</b>	<b>Closing remarks</b>	E Berkey, R Holten

**ATTACHMENT 4**

*GW/VZ INTEGRATION PROJECT*  
**SEPTEMBER 15 – NOVEMBER 15, 1999**  
*TWO MONTH LOOK AHEAD CALENDAR*

<b>September 15-17</b>	GW/VZ Expert Panel Meeting BHI Assembly Room (Contact: Virginia Rohay)
<b>September 15-18</b>	Energy Communities Symposium – Richland
<b>September 16</b>	HAB-ER Committee Meeting BHI Room 2D01 – 9 a.m.-4 p.m.
<b>September 17</b>	GW/VZ Project Picnic Leslie Grove Park #1 – Richland – 1 p.m. (Contact: Karen Strickland)
<b>September 20</b>	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler )
<b>September 23</b>	Regulatory Path Forward Work Group Meeting BHI Room 1B40 – 1-4 p.m. (Contact: Moses Jarayssi)
<b>October 4</b>	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler )
<b>October 5-6</b>	Risk S&T National Labs Workshop #1 Doubletree Hanford House – Richland
<b>October 13</b>	<i>CRCIA-GW/VZ Workshop</i> <i>Hill Street Conference Center – Richland (details TBD)</i>
<b>October 14</b>	HAB-ER Committee Meeting BHI Assembly Room – 9 a.m.-4 p.m.
<b>October 18</b>	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler )
<b>November 1</b>	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler )
<b>November 2-3</b>	Health of the Hanford Site Conference – Tri-Cities
<b>November 4-5</b>	Hanford Advisory Board Meeting Tower Inn – Richland
<b>November 9-10</b>	Risk S&T National Labs Workshop #2 Doubletree Hanford House – Richland
<b>November 15</b>	GW/VZ Open Project Team Meeting BHI Assembly Room – 1-3 p.m. (Contact: Dru Butler )

**Public Comment Periods**

<b>Ends Sept. 30</b>	Risk/Impact Technical Report for the Hanford Groundwater/Vadose Zone Integration Project - Final Draft
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