# ENVIRONMENTAL MANAGEMENT ADVISORY BOARD
# to the
# U.S. DEPARTMENT OF ENERGY

## PUBLIC MEETING MINUTES

**Pacific Northwest National Laboratory**
**902 Battelle Boulevard Richland, Washington 99354**
**May 22, 2014**

## LIST OF ACRONYMS

ASCEM –Advanced Simulation Capability of Environmental Management
CRESP – Consortium for Risk Evaluation with Stakeholder Participation
DAS – Deputy Assistant Secretary
DFO –Designated Federal Officer
DNFSB - Defense Nuclear Facilities Safety Board
DOE – Department of Energy
D&D – Decontamination & Decommissioning
EM – DOE Office of Environmental Management
EMAB – DOE Office of Environmental Management Advisory Board
EPA – U.S. Environmental Protection Agency
ERDF – Environmental Restoration Disposal Facility
EVS – Employee Viewpoint Survey
FACA – Federal Advisory Committee Act
FEHM – Finite Element Heat and Mass transfer code
FY – Fiscal Year
GAO – General Accountability Office
GDP – Gaseous Diffusion Plant
Hanford – (DOE) Hanford Site
HEPA – High-efficiency particulate air filters
HLW – High Level Waste
HQ – Headquarters
LANL – Los Alamos National Laboratory
LAW – Low Activity Waste
LBNL – Lawrence Berkeley National Laboratory
LLW – Low Level Waste
LDR – Land Disposal Restriction
NAS – National Academies of Sciences
NASA – National Aeronautics and Space Administration
NRC – Nuclear Regulatory Commission
OMB – Office of Management and Budget
OR – (DOE) Oak Ridge Site
ORNL - Oak Ridge National Laboratory
ORP – DOE Office of River Protection
Paducah – (DOE) Paducah Site
Portsmouth – (DOE) Portsmouth Site
PNNL – Pacific Northwest National Laboratory
PPPO – Portsmouth /Paducah Project Office
PEGASIS – PPPO Environmental Geographic Analytical Spatial Information System
PHOENIX – PNNL Hanford Online Environmental Information Exchange
R & D – Research and Development
SRNL – Savannah River National Laboratory
SRS – (DOE) Savannah River Site
STOMP – Subsurface Transport over Multiple Phases
SWPF – Salt Waste Processing Facility
TD&D – Technology Development and Demonstration
TOUGH – Transport of Unsaturated Groundwater and Heat
TWS – (EMAB) Tank Waste Subcommittee
WCS – Waste Control Specialists in Andrews, Texas
WIPP – Waste Isolation Pilot Plant
WTP – Waste Treatment Plant

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The Environmental Management Advisory Board (EMAB or Board) was convened at 9:30 a.m., PDT on Thursday, May 22, 2014, at the Pacific Northwest National Laboratory (PNNL) in Richland, Washington. Board Vice Chair Dennis Ferrigno introduced the Board members for the meeting.

Board members present:
Dr. Frank Coffman, AECOM Government Services
Mr. Paul Dabbar, J.P. Morgan Securities, Inc.
Dr. Dennis Ferrigno, CAF and Associates, LLC
Ms. Jane Hedges, Washington State Department of Ecology and National Governors Association
Dr. Kimberlee Kearfott, University of Michigan
Mr. John Owsley, Tennessee Department of Environment and Conservation
Ms. Lessie Price, Aiken City Council
Dr. Beverly Ramsey, Sonalysts, Inc.
Mr. Timothy Runyon, Consultant
Mr. David Swindle, Federal Services/URS Corporation

EMAB Designated Federal Officer:
Ms. Kristen Ellis, DOE Office of Environmental Management

Others present for all or part of the meeting:
Ms. Annette Cary, Tri-City Herald
Ms. Stacy Charboneau, DOE-ORP
Dr. Paul Dixon, LANL
Ms. Vicky Freedman, PNNL
Mr. Mark Freshley, PNNL
Ms. Lori Gamache, DOE-ORP
Ms. Alexandra Gilliland, e-Management
Mr. David Huizenga, Senior Advisor for Environmental Management
Ms. Pam Larsen, Hanford Communities
Ms. Susan Leckband, Hanford Advisory Board
Ms. Sayoh Mansaray, e-Management
Mr. Doug Shoop, DOE-ROL
Ms. Kristen Skopeck, DOE-ROL
Mr. Kevin Smith, DOE-ORP
Mr. Terry Walton, PNNL
Dr. Dawn Wellman, PNNL
Mr. Mark Whitney, Principal Deputy Assistant Secretary for Environmental Management

## OPENING REMARKS

The Environmental Management Advisory Board (EMAB or Board) was convened at 9:30 a.m., PDT on Thursday, May 22, 2014, at the Pacific Northwest National Laboratory (PNNL) in Richland, Washington, by EMAB Vice Chair Dr. Dennis Ferrigno. Dr. Ferrigno introduced the EMAB members and U.S. Department of Energy (DOE) representatives, and welcomed new EMAB members, Dr. Beverly Ramsey and Mr. Timothy Runyon. The meeting was open to the public and conducted in accordance with the requirements of the Federal Advisory Committee Act (FACA). More information about EMAB can be found athttp://energy.gov/em/services/communication-engagement/environmental-management-advisory-board-emab.

Dr. Ferrigno reviewed the meeting agenda and reminded EMAB members to recuse themselves from any discussion topic that presented a conflict of interest.

## HANFORD WELCOME

Mr. Doug Shoop, Richland Operations Office Site Deputy Manager, thanked the EMAB members for traveling to Richland.

The Hanford Site cleanup will work from the outside perimeter in. The site is 586 square miles, 290 square miles includes the Hanford Reserve of which is the national area being cleaned up and managed on behalf of DOE by the U.S. Fish and Wildlife Service. The 220 square mile river corridor will be nearly cleaned up by 2015. The focus after that will be the Central Plateau.

The Hanford site is making strides toward putting the production reactors in interim safe storage; six of the nine reactors have been stored. The B Reactor is now a national historic landmark. There are 500 facilities across the site that contain nuclear, radiological, or chemical contamination and need to be cleaned up. There are also 1,000 sites in the river corridor that also have to be cleaned up. Twenty-three hundred metric tons of fuel have been processed and are now safely stored at the canister storage building.

Twenty tons of plutonium have been stabilized and shipped offsite, a major accomplishment for DOE. Sixteen million tons of waste has been disposed of at the Environmental Restoration Disposal Facility (ERDF), which is a low-level waste (LLW) landfill. Currently, there are groundwater treatment systems in place, both in the river corridor and on the central plateau.

Mr. Kevin Smith, Manager for the Office of River Protection (ORP), welcomed the EMAB members to the Hanford site. The primary mission of ORP is to safely manage the tanks at the central part of the plateau until dispositioning.

Mr. Smith noted that ORP is working to increase the use of national laboratories. ORP wants to leverage the entire network of laboratories, so that the Hanford site can utilize the capabilities, and be cost-effective.

Ms. Susan Leckband, Vice Chair of the Hanford Advisory Board (HAB), gave a brief overview of the HAB. The HAB is chartered under FACA, and provides policy advice and recommendations to DOE, the U.S. Environmental Protection Agency (EPA) and the Washington Department of Ecology. The Board has a diverse and regional representation.

## PROGRAM UPDATE

Mr. David Huizenga, Acting Assistant Secretary for the DOE Office of Environmental Management (EM), began by thanking the Board members for coming to Hanford. He introduced Mr. Mark Whitney, the new Principal Deputy Assistant Secretary for EM. Mr. Whitney stated that he looks forward to working with the Board, and that it is a great time to work at EM because of all the challenges the agency faces.

Mr. Huizenga reported a number of organizational changes. Ms. Tracy Mustin, the former Principal Deputy Assistant Secretary for EM, and Ms. Alice Williams, the former Associate Principal Deputy Assistant Secretary, both retired recently. Also, Mr. Matt McCormick, Manager of the Richland Operations Office, will be retiring later in June; Mr. Shoop will be acting in that position.

Mr. Huizenga noted some of the recent accomplishments at EM:

- K-25 at Oak Ridge National Laboratory has been demolished.
- At the Savannah River Site (SRS), four high-level waste (HLW) tanks were closed, bringing the total number of high-level tanks closed at the site to six.
- At Portsmouth, EM has recycled almost 30 million pounds of material and transferred that material back into the local community reuse organization.
- The Paducah Gaseous Diffusion Plant will revert back to EM later this fiscal year (FY) or early next FY. This will be the last of the large gaseous diffusion plants that needs to be decontaminated and decommissioned.
- EM has also made huge progress on the 2015 Vision at Hanford.

The FY 2015 budget request for EM was for $5.6B. In FY 2014, it was also $5.6B, and Congress awarded EM $108M more than requested.

EM supports President Obama's budget request and is working with Congress on the FY 2015 request. Mr. Huizenga believes that EMAB can help determine how best to use a flat budget for the next few years.

Waste Isolation Pilot Plant (WIPP)

In February 2014, two unexpected events occurred at the WIPP facility. On February 5, a fire occurred and on February 14, a radiation event took place. No workers were injured.

All workers underground when the fire broke out were able to exit safely. Some workers did go to the hospital, but they were released shortly after with no permanent damage. WIPP shut down following the fire. The fire began a half mile from where the waste was being placed, when a salt haul truck caught on fire. EM believes the fire was a preventable accident from which lessons can be learned.

During the radiation event of February 14, about twenty workers were exposed to minor radiation. The ventilation system and the alarm system worked as they were designed to work. As soon as the radiation detector of the continuous-air monitor picked up the radiation signal, it flipped the ventilation system, which began to send the air through high-efficiency particulate air (HEPA) filters. EM initially thought the issue was a radon alarm, because there have been many radon alarms in the past. This is why workers did not seek shelter as soon as they should have, which led to some employees being exposed to radiation. The radiation exposures were very low-- under 10 milligrams. While the health concerns for the exposed employees are minimal, EM is concerned because the goal is to try and minimize any and all exposure. EM will deploy any lessons learned from these events across the EM complex.

Mr. Huizenga stressed the importance of focusing on safety at the facility. The events had nothing to do with the nuclear aspect of the mine; the waste was correctly in place and equipment used for the waste was well-maintained.

EMAB Work Plans

Mr. Huizenga discussed how EMAB can assist EM in the coming year. Mr. Huizenga directed EMAB to work on the following issues:

Large Projects and Management

EM needs to better understand the costs and schedules associated with large capital construction EM projects. Teams of contractors and federal employees, building first-of-a-kind nuclear facilities, continues to result in underestimating cost and schedule for projects to be completed. EM recently got off the U.S. Government Accountability Office (GAO) High Risk List for projects under $750M, but continues to have a poor record when it comes to construction of large facilities. Mr. Huizenga challenged EMAB to figure out a way to help EM with this issue.

Technology Development (TD)

EM has spent about $145B on its program thus far, and will most likely spend at least $200B more. There is still much cleanup left, and EM is spending only $10 to $20M per year on TD. In 2009, the EM program was base-lined at $6B per year, with regulatory and stakeholder expectations from this baseline. However, the program has not had a $6B budget for the last few years. EM can continue to press contractors to become more efficient, but with minimal funds for research there is only so much that can be done.

There are examples of technology investments cutting costs. At PNNL, employees are working on glass loading with ORP and SRS, and as a result EM has made steady

progress at increasing the amount of waste in the glass. This cuts billions of dollars off operations costs, because fewer canisters are being made.

At SRS, EM invested about $50M over a decade to develop a new molecule that effectively strips cesium out of liquid. This will save another $1.5B in operating costs at SRS.

Secretary of Energy Ernest Moniz will soon task his advisory board, the Secretary of Energy's Advisory Board (SEAB) to help DOE institutionalize a TD process. Mr. Huizenga proposed that EMAB find a way to partner with, or to work parallel with, SEAB on this matter. It is not just about institutionalization, but about finding new ways to incentivize contractors.

Los Alamos National Laboratory (LANL) has large glove boxes, and employees are cutting the boxes up, putting them in smaller waste boxes, and shipping the boxes to Waste Control Specialists (WCS) in Andrews, Texas as low-level waste. To try a new method, the team built a giant concrete box at WCS, and lowered the glove boxes into it. This saved time and worker exposure. EM needs to continue to develop technologies and incentivize clever thinking.

Mr. Shoop discussed macroencapsulation, an additional area where EM can save funds. EM is working with the EPA on land disposal restriction (LDR) regulations, and how to implement those regulations. In the past, at Hanford, EM has had very large pieces of radioactively contaminated equipment that were taken to ERDF and then carefully wrapped up and contained. The pieces of equipment were taken down to the cells of the ERDF, placed on blocks with gravel surrounding them, and then permanently disposed. This process would violate LDR requirements because it is disposal prior to treatment. This forces the site to treat the large contaminated items above the disposal site, which results in higher worker exposure to radiation and a bigger potential for releases to the environment. The cost is also higher. The Hanford site is using a polyurea-type of material that creates a lot of emissions to the environment and requires workers to wear respiratory protection. EM and EPA are working to try and find an equivalent process that has more protection for workers.

<u>Prioritization and Risk</u>

Prioritization and risk are not new topics for EMAB, but Mr. Huizenga believes they merit continued discussion.

EM is a risk-based program that spends more than one third of its budget on HLW, which is arguably the highest risk waste stream. EM would like to find ways to partner with the regulators and the community to find a way to be more transparent when explaining the EM risks. Mr. Huizenga recommended that EMAB focus on Hanford and SRS. Mr. Huizenga clarified that he was not discussing an EM-wide, complex-wide risk analysis. He believes that EM allocates money for each site well; but, that given the resources and the challenges that EM faces, it is important to emphasize SRS and Hanford.

***Discussion***

Mr. David Swindle stated that EMAB's Acquisition and Project Management Subcommittee (APMS) recently had a discussion with Mr. David Trimble, whose office of GAO drafts the High-Risk List. Procedurally, DOE is well evolved in determining what should be done, but GAO finds that EM has difficulty in following through with the requirements. The credibility of EM on the Hill is directly related to the stability of these lists. GAO has invited EMAB's APMS to engage in the area of cost analysis in support of the EM budget request. The discipline of following through with both the processes and procedures is a target area. The area of cost analysis, from the federal oversight side, was clearly identified as a focus area.

Mr. Huizenga responded that EM wanted the Salt Waste Processing Facility (SWPF), a pilot-scale facility at SRS, built in one year, but that was not possible. EM worked hard to incentivize the contractors, but the project took longer than one year.

Dr. Ferrigno stated that large projects sometimes take on a life of their own, and that there is challenge to handle surprises, especially when accounting for the complexity of brand new technology, and the complexity of regulatory and public involvement.

Dr. Frank Coffman added that many of the findings and recommendations that the Science & Technology Subcommittee (S &T) have regarding technology development and demonstration (TD&D) address Mr. Huizenga's concerns. He added that a big root cause of delayed projects across the complex is that additional features are continually added to the design. Also, even though a specific contractor is picked to do the design, others are doing the research and development (R&D) for the project. Projects have to be designed to cost, and EM may not be able to afford all the additional features proposed throughout the life of a project.

Dr. Ferrigno added that it is no different in the private industry, and that DOE has just as excellent a system and engineering practice as the private industry, but that DOE has some difficulty in following these procedures. If the research and technology are not there for a project, EM needs to stop the process and go back to the beginning, despite the schedule.

Mr. Paul Dabbar stated that massive cost overruns, timing delays, accountability and issues of restoration are a trend in the private sector as well. The days of fast-paced building have changed.

Mr. Huizenga asked whether there was a pattern and what causes these problems. Mr. Dabbar responded that any project that is the "first of a kind" creates problems, but that does not mean that progress should be stopped. Also, size, on an exponential scale, magnifies execution risk. The complexity issue at the WTP pretreatment plant is not only a "first of kind" issue, but a complex project issue.

Mr. Huizenga responded that if this issue is recognized, then the project leaders should be doing something to address it.

Mr. Dabbar responded that it may not always be possible to address the issue. Because of government structure, the number of required interest groups has changed in the last fifty years. These are global issues, but trying to scale down to a more manageable scheme may help. He added that EM is not unique in this regard, because scope and scale creep are issues that may increase outside input complexities. Execution on the project side is important as well.

Mr. Huizenga responded that laboratories are looking at smaller modular approaches rather than big box construction projects. Mr. Huizenga noted that it also important to incentivize the contractor to get the job done, and that there are penalties for not getting projects completed on time. There was a great incentive to complete the Rocky Flats Plant project, and it saved billions of dollars.

Mr. Dabbar responded that EMAB has talked about this issue from a cost-benefit analysis standpoint. He stated that in the commercial world, technology is only developed if it improves efficiency and reduces costs.

Mr. Huizenga responded that if EM incentivizes the contractor to develop technology and the contractor makes more money by completing the project at a lower cost, it is a win/win situation.

Mr. Dabbar responded that is an area to focus on and that these incentives need to be built into contracts up front. In today's economy, everyone is looking at ways to do more with less. Revenues are not going up, so the way to drive the bottom line is to decrease the costs. This is not just an EM or government issue, but a general economic issue.

Mr. Willie Preacher stated that from an operator standpoint at the facilities, contractors are seen as the working class and need ownership. When the federal government comes to the operator and tells the operator that a project needs to get done, the operator looks for shortcuts, and sometimes these shortcuts can negatively affect the project. Though contractors are looking for a profit, they are also utilizing the time schedule to get there. Contractors who bid on these projects know that they are going to increase costs, and perhaps DOE should try to stop this practice.

Mr. Huizenga responded that people who understand contracting and project management should be able to work together to investigate these issues. Despite EM's expertise, the agency still ends up underestimating cost.

Dr. Ramsey commented that EM needs to go back to the basics and figure out what an integrated project means, and how to keep that project team together throughout the entire process. This way, the contingencies are applied, and work is incentivized as a performance unit. She stated that she hopes that EM goes back to see how to deal with

life-cycle costs, analysis, procurement and procedures in such a way that the people involved can tell EM what worked and what did not, before EM proceeds further.

Ms. Hedges added that in the past, DOE may have been reluctant to admit the cost of projects. Mr. Huizenga responded that he is unsure whether workers are doing estimates incorrectly, lying, or whether estimates are fundamentally impossible to do. The difficulty of estimates needs to be recognized.

Mr. John Owsley added that the remote handled transuranic sludge is one of the more hazardous waste streams on the Oak Ridge Reservation. The agreement was to do the design and cost analysis first, and then set a schedule in the Site Treatment Plan. The process has yet to be proven, but if the process works, and if the schedule for the contracts is reasonable, then DOE and the regulators will be able to work to create a compliance schedule for the project. DOE needs to understand the flexibilities that the regulators have up front.

Ms. Lessie Price stated that she agrees that a flat budget will present some problems for contractors, and questioned whether the relationships between DOE and the contractors are solid enough to discuss true cost overruns, and what to do when these cost overruns occur. She added that EM should put additional funds toward R&D. She added that this is an opportunity to discuss cost savings with Congress.

Mr. Huizenga responded that EM does have strong relationships with many of its contractors and there is a sense of trust. He meets regularly with the contractors' senior management, but believes that a contracting officer or estimator is necessary. However, contractors need to take responsibility when they are at fault, and EM needs to take responsibility when it directs changes. Mr. Huizenga asked what it would take to draw a team together, and have the team stay to the end of a project.

Dr. Ramsey responded that EM must incentivize the project to execution. Dr. Ferrigno added that it is not just about funds, but also about the project deliverable.

Mr. Huizenga asked whether the issue is a result of bad leadership.

Dr. Ferrigno responded that North America needs to get a stronger grip on these larger projects, and should not be so quick to put these projects into construction, and instead should make sure the engineering is in place before proceeding. Dr. Ferrigno added that the Tank Waste Subcommittee (TWS) did a lot of work for the Waste Treatment Plant and the Tank Farms. The TWS was asked how technology in the engineering and construction could help those two projects. For WTP, TWS suggested some basic options: a full-scale mixer technology, capturing Technetium 99, and determining whether it built up in the system or put through glass. Although, EM is currently working with full-scale mixer technology, there is more room for making sure the mixers will work. Full-scale mixing needs to be done. Mr. Huizenga stated that he believes that there is new information on that issue.

Dr. Ferrigno responded that HLW categorization is sometimes based on origin and regulations, not radioactivity levels based on risk. Given the delays at WTP, perhaps now is the time to reevaluate. Dr. Ferrigno asked whether EMAB should be revisiting this idea, and whether the Board should examine the waste acceptance criteria of HLW.

Mr. Whitney responded that he would read over the TWS reports and recommendations to get a better idea on whether EMAB should focus on this issue.

## PRESENTATION: ADVANCED SIMULATION CAPABILITY OF ENVIRONMENTAL MANAGEMENT (ASCEM)

Dr. Paul Dixon, ASCEM Multi-Lab Program Manager, Los Alamos National Laboratory (LANL)

Dr. Dixon thanked EMAB for inviting the ASCEM team to present. For the last five years, EM-DOE has used up to 60 percent of its $10 to $20M technology development budget on the ASCEM project. The ASCEM team is a multi-laboratory team that is composed of people from EM-HQ, LANL, PNNL, Lawrence Berkeley National Laboratory and Savannah River National Laboratory (SRNL).

ASCEM is developing next-generation, science-based reactive flow and transport simulation capabilities and supporting modeling analysis toolsets within a high-performance computing framework to address DOE-EM's waste storage and environmental challenges. Over the years, EM has spent a lot of time and money trying to maintain quality assurance of software codes across the DOE complex. ASCEM hopes to address this issue by creating standardized software that could be used consistently across the DOE complex.

The remaining EM sites are complex, and creating models for these remaining sites is costly and not always timely. But, the goal is to put together more risk-informed and realistic models, so that there is a greater understanding by the public and the oversight bodies.

Codes are difficult to retool for advisory boards and oversight boards. The ASCEM team has tried to build a program that is agile, and can answer their questions quickly.

ASCEM is a state-of-the-art approach and integrated tool set for simulating contaminant fate and transport, both through natural and engineered systems. It is both modular and open source. It addresses the entire modeling process: from development of conceptual models, evaluation of site characterization data, to analysis of site models and post-analysis of model data. ASCEM uses a graded and iterative approach that takes advantage of current and future computing capabilities. The code runs on any laptop, but it also has the capability to run a complex problem or analysis on supercomputers.

In the past, the cost of licensing has been an issue and to combat this, the ASCEM team has leveraged DOE investments and incorporated existing modeling tools whenever

possible, to keep project development costs low.

ASCEM also provides a community platform. Leveraging users in the community will lead to development of needed capabilities outside of EM. This will help with the long-term development costs of ASCEM.

The integrated analysis starts with site characterization. The team does an assessment of the numerical and conceptual models for a site. The team has developed a graded and iterative approach to this, so that they can cycle any feedback into the system and refine it in real time. The parameters of the program can be changed to account for any uncertainty encountered.

The ASCEM team is trying to determine how to best utilize limited data sets at sites, to avoid collecting unnecessary and costly data repeatedly. Ultimately, the goal is to be able to do risk assessments and decision support to evaluate different final site end states.

Dr. Dennis Ferrigno asked whether the dataset at the Hanford Site is sufficient to fill the Monte Carlo method of risk analysis, and whether it is an estimation of the data. He also inquired as to whether this model requires a certain amount of data sets to be compatible.

Dr. Dixon responded that existing sites have limited information about geology and because of this, it is necessary to make assumptions on the data that is missing. Anytime a model is used, assumptions are made. ASCEM allows the user to estimate the parameters in an area, and compare multiple realizations to determine which parameter distributions are most realistic.

Dr. Ferrigno asked whether ASCEM is modeling boreholes that are to get an understanding for what is underground. Dr. Dixon responded that Hanford's BC Cribs and Trenches is a 20-acre plot that has five boreholes; the ASCEM team is using multiple stochastic realizations of possible geologic configurations to best represent the complex geology of the site in the model.

Dr. Ferrigno noted that there are industries that have proven that good exploration and understanding of the data is necessary to replicate and model what is underground. He asked if DOE has looked at some of those industries.

Dr. Dixon responded that the ASCEM team has looked at the programs developed in the oil and mining industries, but EM has never used them. This is the first time a fine-tuned platform and simulator combination has been used.

Dr. Freedman added that there is uncertainty surrounding when resources were released, along with geology uncertainty. There are no accurate historical records of the amount of water actually released in the ground at Hanford.

The user can look at the borehole measurements of concentration and moisture content, and determine if it matches the data. This is a way of iterating, and finding source trends,

which will help determine where the waste is going next.

Dr. Ferrigno asked in terms of the Pump and Treat Program at Hanford, why EM does not use the tools to poke boreholes and to help them understand what is going on underground, before investing more time and money.

Dr. Dixon responded that using a model like ASCEM, the user can determine where a borehole should be is punched, and what to look for that would help reduce the uncertainty to get a better handle on where it is necessary to pump and treat in the future.

The fine stratigraphy in the Columbia Basin is very complex, and in some areas there are limited boreholes, so ASCEM makes assumptions about how the waste is going to behave.

It is necessary to understand where to punch boreholes to get the most value for the information received, because it is expensive to punch a borehole. Dr. Dixon stated that it was valid to question whether it is worth going back in and modeling with more advanced tools, or drilling another hole and collecting more data to see if it is possible to refine when to shut off the pump and treat.

Dr. Dixon explained that the national laboratories that have had the biggest codes being used across the DOE-EM are LANL, LBNL and PNNL; the codes are FEHM (Finite Element Heat and Mass transfer code), TOUGH (Transport of Unsaturated Groundwater and Heat) and Subsurface Transport over Multiple Phases *(*STOMP). Getting those three laboratories to agree to develop a standardized program was the cornerstone necessary to create ASCEM. EM is still using all of those codes because EM has benchmarked against them, and the codes are more mature. ASCEM is tied to a platform, so a user can do all of the processing, pre- and post-processing with the simulator. EM did not previously have this capability.

Dr. Dixon said that the ASCEM code is currently in the R&D stage and will move to a community release with greater QA at the end of 2014. Ultimately, the ASCEM team will create a Nuclear Quality Assurance-1 (NQA-1) code as the team increases in a graded fashion the amount of quality that is added to the program.

Dr. Dixon noted that at Yucca Mountain, everything was done on site, and, it was cost prohibitive. By using a graded approach, it is possible to figure out what works and what should move into the regulatory program. As time and the bottom line increases, the capabilities that get incorporated into the Code become more complex. When the team began building the ASCEM code, the first six months were spent talking to site workers, contractors and regulators about user needs and preferences. The ASCEM team talked to the regulatory group, the programmatic group, and the practitioners because these groups designed the requirements for ASCEM. The ASCEM code was designed around the needs of those who do the work.

Every year the ASCEM team presents at the EM Low-Level Waste Disposal Facility

Federal Review Group, to get feedback. The ASCEM User Steering Committee, which is comprised of people from the U.S. Environmental Protection Agency (EPA), state agencies, contractors, and the Nuclear Regulatory Commission (NRC) also gives the ASCEM team advice on development.

The ASCEM framework includes three major components (toolsets): Akuna, Agni and Amanzi. The platform and integrated tool set is called Akuna. The Velo based system is a set of desktop tools that includes model setup, visualization, etc. The data then gets put into a controller called Agni, which feeds a simulator, Amanzi. Amanzi has enhanced capabilities over some existing simulators. Akuna can be tied into any existing simulator.

Most simulators are based on a structured or unstructured grid. The Amanzi code can run on both grid types. Users can tell Amanzi what kind of grid to use, depending on the complexity of the problem. Problems that require many features, such as tank issues, may need a structured grid.

Dr. Beverly Ramsey asked if any simulator, including those used in the U. S. Navy and NASA could be used. Dr. Dixon responded that he had not specifically looked at those simulators, but that there is no reason that Amanzi could not be attached to any simulator.

Dr. Ferrigno asked if the ASCEM team is looking at the mercury issue at Oak Ridge.

Mr. Mark Freshley, who runs the Site Applications Group within the ASCEM team, responded that there is funding that goes through Oak Ridge's site activities and that the team is beginning to look at incorporating the subsurface component. The mercury issue involves both surface water and subsurface issues. The team is working with Dr. David Watson, the Oversight Manager at the DOE Environmental Remediation Sciences Program in Oak Ridge.

Dr. Ferrigno asked if the ASCEM team is modeling the migration and simulation relative to any underground water. Mr. Freshley stated that the team is just getting started, but that is the intent.

Dr. Coffman noted that the proof for all this development activity is whether operators will be using the software to do their modeling sometime in the future. Mr. Freshley answered that the ASCEM team has pushed the code out to the contractors at Hanford and other sites across the complex. The team kept the initial release limited to avoid too much feedback. The program will be pushed out to more people after they get the community code. He agreed with Dr. Dixon about using a graded quality assurance approach because if the team releases a tool that is not qualified, it can cause problems.

Dr. Ferrigno asked where the ASCEM team is in the release level of the code for practicable application. Mr. Freshley responded that the code was released to about 30 people and that there are users are beginning to use the simulator to address problems.

Dr. Dixon added that the goal of the ASCEM team is to get to a point where the sites own

the platform, and they are the ones to deploy it. The ASCEM team would just be around to assist with technical issues. The ASCEM team is doing outreach by running tutorials, running guided interactions of users, answering questions and giving on-line feedback. The ASCEM team is having sessions this summer with user groups and doing targeted interactions with groups at Hanford, SRS, Lawrence Berkeley National Laboratory, Los Alamos, and the Nevada National Security Site (NNSS).

Dr. Dixon demonstrated a simulation of seepage ponds at SRS.

Dr. Dixon then discussed what the ASCEM team is working on at each site across the complex:

Hanford

- BC Cribs and Trenches
- Fine-grain heterogeneities and how they impact radionuclides moving through the subsurface, both in the vadose and saturated zone

SRS

- Water movement in and around the tanks and tank farms
- Tritium migration and how to make a realistic model of migration at the Savannah River and around the F-Basin to better understand what needs to be completed for remediation.

NNSS

- Underground testing on the hydrographic basin Frenchman Flats has been completed and the team is now entering model validation. ASCEM is being used to do validation of the models.
- ASCEM is being evaluated with the newer version of GoldSim and MODFLOW to look at a code that can represent transport into fractured volcanics on Pahute Mesa.

Dr. Dixon discussed the ASCEM team's timeline:

- The team demonstrated individual modules in 2010 and integrated modules in 2012.
- A limited user release occurred in fall 2013.
- A Community Code will be distributed in late 2014.
- A Regulatory Code is slated for mid-2016.

Dr. Ferrigno asked what is preventing the regulatory code from being released before 2016.

Dr. Dixon answered that currently the ASCEM team is trying to develop a user base and complete the QA program with a limited budget. The team could develop it and get it qualified earlier, but there is concern that if the team stops the interaction with the users due to budget issues, that ASCEM will lose potential users. He plans on asking for feedback on this when ASCEM has its second technical peer review in 2015.

Dr. Coffman noted that getting the ASCEM program deployed requires a lot of interface

and outreach. The earlier the interface is done, the better.

Dr. Ferrigno inquired about ASCEM's fiscal year (FY) 2014 budget.

Dr. Dixon replied that it is $4M. Dr. Ferrigno noted that Mr. Huizenga mentioned that he believed TD funds should be increased, and asked whether EM could provide additional funding to get ASCEM released by mid-2015. Dr. Dixon responded that the original plan before budget reductions for the past 3 years was to have ASCEM qualified in 2015.

Dr. Ramsey agreed with Dr. Ferrigno and mentioned that it is important for EM to be able to show the public where it stands. The speed-up of remediation is what needs to be improved to make it better.

Dr. Coffman mentioned that people typically want to use pre-existing commercial products, and that it is important to show ASCEM is a better product, so that the user does not think that EM is wasting funds to recreate a product that already exists. Dr. Dixon agreed and mentioned that when GoldSim was used at SRS, it was thought to be a state-of-the-art program, and now SRS is asking the ASCEM team for help because GoldSim cannot answer questions for the NRC efficiently.

Mr. Timothy Runyon asked if ASCEM is an ESRI platform. He noted that sometimes laboratories maintain control over tools that they develop. Dr. Freedman responded that the ASCEM team tried to build a program that was not a laboratory niche code, but was open source. The goal was to have all the laboratory people agree on what should collectively be developed.

Mr. Runyon asked if ASCEM is also capable of making judgments based on empirical data that updates constantly. Dr. Dixon responded yes, the decision support piece of ASCEM allows the user to input data, and because ASCEM is modular its toolset can be attached to previously developed programs in order to increase capability.

Dr. Vicky Freedman, Senior Research Scientist, PNNL

Dr. Freedman presented background information on Hanford BC Cribs, which was the principal site used for the Phase 2 demo that took place in FY 2012.

She then demonstrated the ASCEM tool sets at Hanford.

Dr. Freedman explained that there are several parts to the software, and a difficult part of modeling is figuring out how to translate the conceptual understanding of a site into numerical model inputs. This is a difficult task, and when a user is unfamiliar with the software, this task is made even more difficult. Once the simulation is executed, then an additional challenge is to analyze the output. The focus of the platform tool set is to assist users in the modeling work flow by providing them with pre- and post-processing tools. A figure was presented that showed three gears, Akuna, Amanzi and Agni. Akuna is the biggest gear, because it is the primary interface.

ASCEM cannot substitute for scientific expertise, but ASCEM has a collection of toolsets that will help scientists figure out how to organize and visualize site data. Afterward, it is necessary to translate the conceptual model into a numerical model setup. Dr. Freedman demonstrated the model setup tool, which is a user interface that allows the user to enter data that will be used in the simulation.

Once the model is set up, many different kinds of simulations can be executed. A single run is when only one simulation is executed (SR Toolset). For example, a single run might be used to see how it compares to measured data out at the site. If simulated data does not match what has been measured, a calibration might be performed (PE Toolset). Before doing a calibration, a user may want to determine which parameters are sensitive through a sensitivity analysis (SA Toolset). For a range of future conditions, an uncertainty analysis can be performed with the UQ Toolset.

The primary advantage of the Amanzi simulator is the fact that Amanzi is built from the ground up as being parallel. Amanzi can be launched on a single processor, or 10,000 processors, and multiple simulations can be launched simultaneously. Akuna provides a user-friendly interface to easily launch and monitor the simulations.

Dr. Freedman demonstrated how to analyze results using visualization tool sets, using the BC Cribs site as an example.

The BC Cribs are located on the central plateau at the Hanford site. At Hanford, ten million gallons of liquid waste was disposed into the cribs and trenches from 1956 to 1958. The waste was disposed of under the assumption that it would remain in the vadose zone due to specific retention.

There are five boreholes at BC Cribs, which can contain data on major stratigraphy, and produce a typical pancake layer model. There are a lot of heterogeneities from analogue sites that exist under the BC Cribs.

The five boreholes do not give a lot of information about the complexity of the subsurface. The ASCEM team used a phased approach to develop a subsurface lithofacies map, where the team used geophysical data in combination with hydraulic property data, and incorporated heterogeneity into the conceptual model. This model uses geostatistics, and because it is statistical, the team created 100 realizations of the conceptual models to quantify uncertainty in contaminant transport predictions.

The team looked at ten different realizations in 2012. There are some small-scale differences between each of the cross-sections shown through the cribs. There are six cribs, aligned as two rows of three. When liquid waste is put into the subsurface, if there is fine-grained material, the waste will immediately move laterally. If there is coarser-grained material in the area, then it has a tendency to move vertically through the system. The BC Cribs model simulates historical flows to set a baseline condition for remediation. Soil desiccation is a potential remedial alternative at the BC Cribs site.

ASCEM is a collection of tool sets; Akuna is the interface that links them all together. The user works with Akuna. Users install the software locally on their laptop, but access a remote when simulations are launched. Users are able to take tutorials or browse projects. When logging into the server, users create a team, people at different locations working on the files simultaneously, and use the shared directory to create folders. Users are able to create layers with specific measurements, and generate grids. After completing the initial information, users choose what kind of stimulation to run. When doing an uncertainty analysis, users can the parameters and ASCEM will select the distribution of parameters, and change the kinds of sampling for those parameters.

Once this is launched, users can conduct analysis. Users can look at the mean and the 95-percent confidence intervals of the output. There are two kinds of visualization: point visualization, where the simulation shows what has happened over time at a particular point; and full spatial realization, which shows what is occurring on the domain.

Dr. Ramsey asked whether stochastic drivers could be used as well as deterministic drivers. Dr. Freedman responded that the ASCEM team is using stochastic drivers to generate different realizations of the domain.

Dr. Freedman added that the ASCEM team is looking for sites where they can demonstrate and test the software.

## PUBLIC COMMENT

Ms. Pam Larsen, Executive Director of Hanford Communities, gave a public comment. Ms. Larsen also chairs the River and Plateau Committee for the HAB and is a member of the Combined Intergovernmental Working Group. For the past few years, the intergovernmental group has put groundwater cleanup on the agenda of its meetings. ASCEM has been particularly intriguing because of the partnership between the National Laboratories; this tool is extremely important as Final Records of Decision at Hanford approach.

Ms. Larsen also discussed the PNNL Hanford Online Environmental Information Exchange (PHOENIX) (a two- and three-dimensional system of modeling information, which is extremely useful in looking at contamination plumes). PHOENIX has had a lot of support from EM leadership because the more information that is available the more informed decisions can be made, especially with limited funds. From a stakeholder perspective, PHOENIX is very useful because I of its visual nature and 3-D modeling

## SUBCOMMITTEE UPDATES

Science and Technology Subcommittee Report

Dr. Coffman, Co-Chair of S &T, provided an update on S&T activities and presented a brief overview of the S&T draft report on the *DOE-EM Technology Development and*

*Deployment Program*. Subcommittee members include: Dr. Kimberlee Kearfott (Co-Chair), Mr. Owsley and Dr. Ferrigno. The S & T report is available in full at http://energy.gov/sites/prod/files/2014/05/f16/TAB%208.1%20S%20%26%20T%20Report%20%28052114%29.pdf.

S&T was asked to recommend how EM could best structure, manage and communicate its existing Technology Development and Deployment program, to be most successful in a fiscally constrained environment. S&T was asked to compare the advantages and disadvantages of centralizing versus decentralizing at the sites.

In its report, S&T submitted seven recommendations for EMAB's consideration:

**Recommendation 2014-01:** It is recommended that TD&D program mechanisms be put into place to actively search out and engage industry and agencies, domestically and abroad, who have similar/relevant environmental restoration problems and associated regulatory and project management challenges.

**Recommendation 2014-02:** It is recommended that EM be chartered with testing, evaluating and demonstrating technologies, technical approaches, design approaches/ innovations, siting approaches and regulatory innovations which will minimize the future DOE cleanup costs associated with current and future construction activities at DOE.

**Recommendation 2014-03**: The Subcommittee recommends that a DOE Fellowship program be put into place which strengthens DOE's present piecemeal, limited programs for University students. Features should include summer internships at DOE's National Laboratories, and adequate two and four year fellowship tenures to attain advanced degrees.

**Recommendation 2014-04:** DOE-EM should establish a single interface organization for regulatory authorities. EM should negotiate clear "Rules of Engagement" for all interactions and negotiations with DNFSB and other regulatory stakeholders to ensure all information and communications are mutually understood and known. The result should be timely, non-political resolution of DOE-EM project R&D needs, requirements, and features.

**Recommendation 2014-05:** The DOE-EM TD&D program, in collaboration with EM project representatives, conduct periodic RD&D and project technology reviews, which address the following:

- Whether multi-faceted, complicated technical problems can be "de-bundled" to create better solutions; and
- How existing technologies can be adopted in innovative/transformational ways to reduce technical risks, costs, or schedules?

**Recommendation 2014-06:** DOE should find a way to substantially increase project related R&D funding to ensure that unanticipated technological issues can be expeditiously addressed, thus minimizing project overruns and avoiding external

criticism associated with having a limited R&D program, which is too small to adequately accompany DOE-EM's large projects.

**Recommendation 2014-07:** Newly funded R&D should only be invested in programs that:

1. Current technology is not cost effective in complying with cleanup standards.
2. Risk of current technology or technical approach is excessive.
3. The programs have sufficient schedule that new technology would be able to impact the results (short term success).
4. Return on investment is cost effective.

Dr. Ramsey asked about the phraseology in Recommendation 2014-02, and whether "with current and future construction activities" was meant to limit it to construction activities. Dr. Coffman responded that it was meant to limit it to projects, design and construction of new major facilities.

Ms. Jane Hedges stated that fundamentally she does not have a problem with Recommendation 2014-07, except that it is focused on cost effectiveness.

Mr. Runyon added that current technologies should be made about cost effectiveness, and possibly a separate bullet should be added for technology.

Dr. Ferrigno suggested changing the language to: "current technology is neither time effective, or cost-effective or timely." Dr. Coffman agreed.

Ms. Hedges asked Mr. Coffman to further explain the single interface organization for the regulatory authorities. Dr. Coffman responded that the Subcommittee believes there should be a single regulatory group in DOE-EM, so that there is a consistent way of communicating.

The full S&T report was voted on and approved by the Board with the following editorial changes to recommendations 2014-02, 2014-03, 2014-05 and 2014-07.

Changes are highlighted below:

**Recommendation 2014-02**: It is recommended that EM be chartered with development of DOE Hazardous Facility Design and Construction Guidelines and Requirements that must be followed for all new facilities and sites. The objective is to avoid future costs and risks associated with D&D of facilities and sites which have handled radioactive and hazardous materials. The associated RD&D program should include evaluating, testing and demonstrating. The program would focus on:

- Technologies/technical approaches
- Design approaches/innovations
- Siting techniques/approaches
- Regulatory innovations

**Recommendation 2014-03:** The Subcommittee recommends that a DOE Fellowship program be implemented to strengthen DOE's present piecemeal, limited programs for university students. Features should include summer internships at DOE's National Laboratories, and adequate two and four year fellowship tenures to attain advanced degrees.

**Recommendation 2014-05:** The DOE-EM TD&D program, in collaboration with EM Project representatives, should conduct periodic joint RD&D and project technology reviews, which address the following:

- Whether multi-faceted, complicated technical problems can be "de-bundled" to create better solutions
- How existing technologies can be adopted in innovative/transformational ways to reduce technical risks, costs, or schedules
- Putting project costs, schedule, and performance at risk by selecting less proven, "higher promise" technologies vs. "proven" technical approaches that have functioned adequately in past, similar applications.

**Recommendation 2014-07:** Newly funded R&D should only be invested in programs wherein:

1. Current technology is neither cost effective nor timely in complying with cleanup standards.
2. Risk of current technology or technical approach is excessive.
3. The programs have sufficient schedule that new technology would be able to impact the results (short term success).
4. Return on investment is cost effective.

Acquisition and Project Management Subcommittee Report (APMS)

Mr. Swindle, Co-Chair of APMS, provided an update on APMS activities and presented the *Report of Activities for May 22, 2014, Public Meeting*. The APMS report is available in full at http://energy.gov/sites/prod/files/2014/05/f16/EMAB%20Acquisition%20and%20Project%20Management%20Interim%20Report.pdf.

APMS continues to have discussions with Mr. Jack Surash, Deputy Assistant Secretary for the Office of Acquisition and Project Management, which focus on contract and project management staffing and skills, and federal oversight.

There are differences of opinion between DOE headquarters (HQ) and the Field Offices per what an appropriate level of federal oversight is, and what the appropriate roles and responsibilities are in project management.

EM recently held a program management workshop that looked at EM acquisition and project management. Two key issues came out of these workshops: the alignment of

contract incentives and the lack of lessons learned being shared on major complex projects.

APMS has an invitation to meet with GAO's Mr. Trimble and his team, on the question of cost analysis effectiveness from the federal oversight side and to discuss contractor quality assurance execution.

APMS' recommendation focuses on the idea that EM should continue to conduct and sponsor sessions for contract and private leaders in workshops on federal contracting.

In its report, APMS submitted one recommendation for EMAB's consideration:

**Recommendation 2014-1:** EM should continue to support the conduct of periodic contract and project management workshops for federal and contractor personnel.

The full APMS report was voted on and approved by the Board.

Risk Subcommittee Report

Mr. Owsley, member of the Risk Subcommittee, provided an update on subcommittee activities and presented the report on *Incorporating Risk and Sustainability into Decision Making*. The Risk Subcommittee report is available in full at http://energy.gov/sites/prod/files/2014/05/f16/EMAB%20Acquisition%20and%20Project%20Management%20Interim%20Report.pdf.

The Risk Subcommittee was asked to look at ways to incorporate risk and sustainability into DOE EM's cleanup decision-making. Although the basics of sustainability do not have specific recommendations to that intent, anything that improves the situation moves towards providing a sustainable solution to that problem. Mr. Owsley advocates that a risk decision that improves the situation certainly improves the sustainability.

In its report, the Risk Subcommittee submitted three recommendations for EMAB's consideration:

**Recommendation 2014-01:** The Subcommittee acknowledges that reaching consensus on the definition of risk is difficult, but that a prioritization of resources based on risk and other factors may necessitate it. The lack of a concrete definition makes establishing risk prioritization difficult. A workable definition of risk and a value system should be created to determine risk prioritization.

**Recommendation 2014-02:** DOE-EM should not adopt the CRESP processes in their entirety, but use CRESP as a mechanism to incorporate additional factors, outside the normal factors of risk, such as the impact on culture, into decision-making. DOE-EM may also use these processes to communicate to the public why some projects are chosen, while others are delayed.

**Recommendation 2014-03:** The Subcommittee is aware that different sites will require different techniques to communicate risk to the public, based on the varying capabilities at each site. CRESP's techniques at Oak Ridge may not be appropriate at every site. Some sites lack the capabilities of Oak Ridge, and for those sites that do lack those capabilities, even a simple breakdown of risk concerns that go into decision-making would be beneficial.

The full Risk Report was voted on and the Board approved recommendation 2014-02, and rejected recommendations 2014-01 and 2014-03.

In response to Recommendation 2014-01, Dr. Ramsey asked why EMAB was looking to define risk versus finding the process that leads to a decision. She added that she did not believe that EM would ever come to a holistic consensus as to how to define risk.

Dr. Ramsey asked for confirmation that Mr. Huizenga is not interested in risk prioritization across the complex, and wants to handle it site-by-site. If that is the case, then she believes it may be possible to come up with a system.

Mr. Owsley agreed and noted that previously the Subcommittee stated that the most successful efforts to date have been those efforts at a local level.

Dr. Coffman added that some sustainability issues have been incorporated into the decision-making because it is in the design guidance for new projects. He also asked whether risk-based prioritization is too focused on health and safety versus project cost and schedule risks. A lot of decisions are aimed at zeroing out health and safety risks.

Dr. Ferrigno suggested that the Subcommittee table Recommendation 2014-01 for rework.

Ms. Hedges added that it would be helpful to the Subcommittee to get the other members' feedback on not just specific wording for the recommendation, but general concepts as well.

The Board approved Recommendation 2014-02.

Dr. Ferrigno stated that Recommendation 2014-03 is not a recommendation, but is a finding, and recommended that the Subcommittee move that language to the "Findings" portion of the report.

Mr. Owsley agreed.

<u>Risk Communications Update</u>

Ms. Hedges, Co-Chair of the Risk Communications Subcommittee, provided an update on Subcommittee activities.

In May 2013, the Risk Communications Subcommittee presented an interim report on the Strategic Planning Tool, which is a communication tool designed for decision-making, and to help people understand decision-making.

EMAB members who saw the demonstration of the Strategic Planning Tool were not convinced of the effectiveness of the tool. The tool had limitations, despite useful graphics. The Subcommittee did feel that it was important to be able to graphically show stakeholders and the public the difficulty of making decisions within EM.

The Risk Communications Subcommittee was tasked with looking at various sites' software tools. The Subcommittee looked at: PHOENIX at Hanford, Intellus at LANL, and PEGASIS (PPPO Environmental Geographic Analytical Spatial Information System) at Portsmouth/Paducah Project Office. The Subcommittee is waiting to review ASCEM, before proceeding with a final report.

The Subcommittee found that the tools were all different. The goal of the Subcommittee is to provide a discussion and recommendation of the software tools.

Management Excellence Subcommittee Update

Mr. Dabbar, member of the Management Excellence Subcommittee (MES), provided a verbal update on MES activities.

The MES has reviewed a large amount of material regarding the Employee Viewpoint Survey, documents on improving the EM workforce issues, and workforce motivation.

The Employee Viewpoint Survey is an important strategy in achieving a baseline for the employee workforce and motivations of EM. The Subcommittee has reviewed the Employee Viewpoint Surveys (EVS) of 2011 and 2013. There is a tremendous amount of data, compared to several years ago. Benchmarking is done, using a best-in-class target within the federal government, which in DOE-EM's case was the NRC and National Aeronautics and Space Administration (NASA). EM uses these benchmarks to compare the surveys, workforce issues and feedback. The NRC and NASA tend to have the higher end of statistics and views of employees.

There are a lot of technical and infrastructure differences between HQ and the field. Over the last year, the survey results have been lower in terms of the positive feedback from employees. Out of 100 questions, only one question improved by five points over the last year; sixteen items decreased.

Overall, EM is about ten to fifteen percentage points behind the NRC and NASA on each question. There are some positive answers regarding work and life balance, but overall there is an indication that additional attention to these matters is necessary.

EM-70 should work with EM leadership and Site Managers to analyze the data and identify concerns, and how to move forward. There is a greater amount of data than in

the past, and that is a positive aspect. It is important for EM's senior management to develop an action plan site-by-site.

The Subcommittee will continue to review the EVS and develop recommendations based on available information.

**BOARD BUSINESS**

Approval of the December 3, 2012, Meeting Minutes

Approval of the December 3, 2012, EMAB public meeting minutes was nominated for motion by Ms. Price, seconded by Dr. Coffman, and approved by the full Board with none opposed, and noted abstentions of Dr. Ramsey and Mr. Runyon.

2014 Meeting Schedule

EMAB is tentatively scheduled to hold its next public meeting in Washington, D.C. in mid-October or early November.

Subcommittee Assignments

Dr. Ferrigno suggested that Mr. Huizenga's charge to look at large projects should be delegated to the APMS, and recommended that Dr. Ramsey join Mr. Swindle as Co-Chair. Mr. Dabbar also agreed to join APMS.

Mr. Runyon agreed to co-chair the Risk Subcommittee with Dr. Carolyn Huntoon, and to look at prioritization and risk, with a focus on Hanford and SRS.

Adjournment

Ms. Hedges motioned to adjourn the meeting. Dr. Coffman seconded the motion, and adjournment was approved by the Board. Dr. Ferrigno adjourned the meeting at 4:12 p.m., PDT.

I hereby, certify that, to the best of my knowledge, the foregoing minutes are accurate and complete.

Dennis Ferrigno
Vice Chairman
Environmental Management
Advisory Board

Kristen Ellis
Designated Federal Officer
Environmental Management
Advisory Board

These minutes will be formally considered by the Board at its next meeting, and any corrections or notations will be incorporate into the minutes of that meeting.