# LAND MID-CYCLE REVIEW SUBCOMMITTEE

## Conference Call Summary
## Thursday, April 24, 2008
## 10:00 a.m. – 12:00 p.m. Eastern Time

### Welcome
*Dr. Charlie Menzie, Exponent, Inc., Subcommittee Chair*

Dr. Charlie Menzie, Chair of the Land Mid-Cycle Review Subcommittee, welcomed the participants to the Subcommittee's second conference call. After taking roll of the Subcommittee members, he asked each EPA participant to introduce him or herself. He outlined the agenda of the teleconference and asked participants if there were conflicts in case the call ran long; there were none.

### Administrative Procedures
*Ms. Heather Drumm, U.S. Environmental Protection Agency (EPA)/Office of Research and Development (ORD), Subcommittee Designated Federal Officer (DFO)*

Ms. Heather Drumm, DFO of the Subcommittee, reviewed the Federal Advisory Committee Act (FACA) procedures that are required for all Board of Scientific Counselors (BOSC) Subcommittee meetings. As DFO, she is present to ensure that FACA requirements are met. A contractor recorded the minutes of the conference call, which will be available on the BOSC Web Site after being certified by the Chair. Per FACA requirements, information about this teleconference was published in the *Federal Register*, and an electronic docket was established. This conference call was convened specifically to review the progress of the Land Research Program since 2005. The Subcommittee members should have received materials relevant to this discussion via e-mails on April 22, 2008, and April 23, 2008. All presentations relevant to this call are available on the BOSC Web Site. Although no requests from the public have been received, the agenda allows time for public comment at 11:25 a.m. Ms. Drumm asked all speakers to identify themselves when making a comment to ensure the accuracy of the minutes.

Before the presentations began, Dr. Menzie provided Subcommittee members with a brief overview of their writing assignments. Three workgroups of two people will be formed as follows: Mr. Tim Thompson and Dr. Robert Siegrist will work on contaminated sediment and materials management (disposal, reuse, and containment); Drs. Lynne Haber and Charles Haas will focus on materials management, emerging research (including nanotechnology), and resource conservation; and Drs. Menzie and Jim Clark will concentrate on multimedia, technical support, and ground water. The specific assignments will be discussed later, but this will assist Subcommittee members as they listen to the presentations.

## Goal 1 Progress

Contaminated Sediments

*Dr. Dale Hoff, EPA/ORD/National Health and Environmental Effects Research Laboratory (NHEERL)*

Dr. Dale Hoff stated that BOSC has commented on the Land Multi-Year Plan in the past, and the current objective is to discuss progress made since 2005. The goal under the contaminated sediments theme is to adequately characterize the nature and extent of contamination and estimate exposure and effect; remedial alternatives also are considered. One specific goal was to develop a sediment sampler capable of collecting the upper soil layer in an undisturbed state. The sampler is able to collect sediment layers that clearly show differences in concentrations of indicator contaminants and parameters. As a result of the engineering, there have been several requests to use the undisturbed surface sediment sampler at various Superfund sites. Because the top layer of sediment is extremely interactive with biota, it is of particular interest, and EPA is developing a companion unit that uses ultrasonic sound waves for characterization.

In terms of fate and transport characterization, EPA has augmented the Environmental Fluid Dynamic Code Model. It is highly sought after and has been employed in a number of sites in several regions. The model allows examination of the locations to which contaminants move from the initial source of pollution. Other work in exposure modeling is continuing with the development of a biota-sediment accumulation factors (BSAF) dataset from Superfund sites that is available online to programs and regions. Users can import their own data, compare data, examine BSAF behavior, and determine trophic transfer. The dataset can be used for initial screening assessments for sites with limited or no field data. It has comparisons of relative bioaccumulation potential of different classes of compounds, and several plotting capabilities are provided. This has been coupled with the polychlorinated biphenyl (PCB) residue database. Output is used to evaluate predicted effects of tissue concentrations and investigate residue-effect behavior. Comparison of PCB toxicity results can be expressed as total PCB or dioxin equivalence, and PCB toxicity data gaps can be identified. The next steps are to coordinate with National Risk Management Research Laboratory (NRMRL) researchers to evaluate accumulation among various remedial action alternatives and to extrapolate BSAFs among various trophic positions within and among sites.

After unacceptable risk has been determined, remediation is considered. Dr. Hoff described a laboratory resuspension study using sediments collected from the New Bedford Harbor Superfund site. Because of concern about suspended solids related to contaminated sediments beyond a dredged area, researchers compared the uptake of PCBs from the water column by polyethylene devices and mussels deployed in New Bedford Harbor during and after a remedial dredging event. The devices showed increased uptake, and mussels had increased accumulation compared to the devices. A similar study may be conducted in Region 9. Physical impacts on resident biota are significant, and three tasks involving sediment profile imaging were undertaken to assess the benthic effects of remedial activities. Dr. Hoff also reported on the progress of monitored natural recovery and capping research, including a technical white paper and two manuscripts.

Progress under innovative risk management research has occurred in two areas: (1) metals speciation, and (2) electrochemical destruction, reactive metal, and advanced oxidative technologies. Metals speciation is important for risk characterization and remediation design. Research in this area has led to new approaches to alter and measure metal bioavailability. This technique was demonstrated at numerous metal-contaminated sites. In terms of electrochemical destruction, reactive metal, and advanced oxidative technologies, ongoing research focuses on developing low cost *in situ* and *ex situ* innovative technologies for remediating PCB-contaminated sediments, and numerous regions have requested technical assistance in evaluating technology applications. A demonstration study at Region 5's Waukegan Harbor Superfund site is being designed.

Innovative tools development involves investigating tools to characterize the flux of compounds in sediment. Semipermeable membrane devices and solid-phase microextraction fibers and polyethylene films have been developed and evaluated, and a draft report and journal article have been completed. Another innovative tool involves the sediment-water interface. A prototype bidirectional advective flux meter for measuring water transport across the sediment-water interface has been successfully developed and field-tested, and it is being used to characterize and support the design of a remedial alternative for ground water and surface water flux at Region 2's Anacostia River Superfund site.

Dr. Hoff highlighted the progress made on dredging research at the Ashtabula River site. Field measurements of volume and contaminant characterization and resuspension during dredging have been taken. The availability of contaminants in postdredging residuals was evaluated, and researchers determined whether conventional characterization techniques can be used to measure residuals and evaluate alternative techniques. An approach for estimating the volume and concentration of postdredging residuals is being developed, and the manner in which contaminant mass removal relates to reduced risks to aquatic and human receptors is being evaluated. The results of the Ashtabula project have been compiled in a large database, and the findings will be used to select the most effective and environmentally correct remediation. Numerous publications have emerged from this project, and researchers are investigating additional sites for more data.

Ground Water
*Dr. Robert Puls, EPA/ORD/NRMRL*

In terms of dense nonaqueous phase liquid (DNAPL) source remediation, many research and technical support activities have been undertaken by a number of laboratories: (1) laboratory and field investigations of DNAPL source zone treatment and partial source removal (i.e., the Strategic Environmental Research and Development Program [SERDP] project); (2) field studies of methods to improve DNAPL source characterization and evaluate plume response (a newly funded SERDP project); (3) critical review and evaluation of mass flux field measurement techniques; and (4) technical assistance at numerous sites. This work has resulted in better methods to assess DNAPL sites, and partial DNAPL source removal benefits are being assessed. Outputs from this research have included a number of publications, including user manuals and journal articles, presentations, workshops, and training. Clients and coordinators in this effort include the Office of Solid Waste and Emergency Response (OSWER), the Office of Superfund Remediation and Technology Innovation (OSRTI), regional and state environmental regulators, and the Department of Defense (DoD) through SERDP.

Research and technical support activities in the area of *in situ* chemical oxidation and thermal treatment include: (1) laboratory investigations of fundamental mechanisms involved in oxidation and reduction transformations during *in situ* chemical oxidation; (2) identification and manipulation of environmental conditions to minimize undesirable reactions contributing to process inefficiency and to facilitate favorable transformation reactions; (3) field demonstration and validation of peroxygen-based *in situ* chemical oxidation; and (4) technical support to most regions on technical feasibility, process optimization, and performance monitoring. These activities have resulted in the improved application of technology and accelerated site closure. Numerous publications, reports, workshops, and trainings have arisen from this work. Clients and coordinators in this area include OSWER, OSRTI, regional and state environmental regulators, DoD, and the Department of Energy (DOE).

A number of laboratory and field studies have been completed in the area of permeable reactive barriers, including those that examine chemical, hydrogeological, and microbiological factors that affect the performance of permeable reactive barriers. Other activities include development of permeable reactive barriers strategies for long-term performance monitoring for treatment of ground water contaminants, use of organic-based media permeable reactive barriers to remediate ground water contamination, and technical assistance at numerous sites. This work has resulted in improved understanding of permeable reactive barrier systems, including enhanced understanding of the role of microbiological and abiotic

reactions and permeable reactive barrier life cycles, and increased efficiency and cost-effectiveness in the design of permeable reactive barrier technologies and monitoring. Many journal articles, platform presentations, and workshops have resulted from this work. Clients and coordinators for this topic include OSWER, OSRTI, regional and state environmental regulators, and DoD.

In terms of monitored natural attenuation of inorganic contaminants, field and laboratory research has been completed on the attenuation of inorganic contaminants in ground water and sediments, and well-head arsenic remediation for public water supplies has been accomplished. Technical assistance has been provided to numerous remedial project managers. As a result, costs have been reduced, and a common framework for site assessment has been published. The work has produced a two-volume report that provides regions and others with a common approach for the assessment of monitored natural attenuation of inorganic contaminants. Numerous reports, journal articles, platform presentations, and workshops also have resulted from this work. Clients and coordinators include OSWER; OSRTI; regional, state, and tribal environmental regulators; DoD; DOE; the National Institute of Environmental Health Sciences (NIEHS); and community coalitions and action teams.

Work on monitored natural attenuation of organic contaminants also has been completed, including the determination of the contribution of abiotic processes to degrade chlorinated solvents in ground water and the development of tools to predict the rate and extent of nonbiological transformations of chlorinated solvents. Technical assistance has been provided to numerous remedial project managers in this area. As a result of these research activities, greater understanding of biotic and abiotic processes contributing to natural attenuation of organic compounds has been achieved. Many reports, journal articles, presentations, workshops, and training courses have resulted from this work. Clients and coordinators include OSWER; OSRTI; regional, state, and tribal environmental regulators; DoD; and DOE.

Emerging research in nanotechnology was initiated through an OSWER pilot program examining the use of emulsified iron nanoparticles. The goal is to evaluate long-term performance of emulsified zero-valent iron and differentiate biotic versus abiotic pathways of dechlorination. It is anticipated that this research will assist in the development of a novel approach to DNAPL source remediation and increase understanding of the mechanisms influencing nanoparticle fate and transport. Although the research was initiated less than 1 year ago, it has been presented at an international conference. Collaborators in this area include DoD, DOE, and the National Aeronautics and Space Administration. Another area of emerging research is *in situ* chemical reduction. Laboratory studies are evaluating mechanisms and potential benefits of treating chromium waste with a chemical reductant, and a field investigation and feasibility study of using a ferrous sulfate-sodium dithionite solution to treat chromium contamination is ongoing. This work has resulted in a journal article, a manuscript (currently in review), and a patent. OSWER and regional environmental regulators are collaborating on this project.

Multi (Analytical/Mining/Asbestos)

*Dr. Randy Wentsel, EPA/ORD, National Program Director (NPD) for Land*

Activities occurring under the multimedia theme of Long-Term Goal 1 are: (1) site characterization, (2) analytical method development, (3) mining monitoring and remediation, (4) asbestos health effects investigation, and (5) technical support. This work has resulted in the development of the ProUCL 4.0 Statistical Software Package, which provides upper confidence limits supporting cleanup decisions. The software can be downloaded, and EPA provides users with updates. The software program is in use by private industry, consultants, states, academia, federal government agencies, and international users. Multimedia work also has improved various analytical techniques involving mass spectrometry, allowing direct analysis in real time and rapid screening of field samples. These tools are of interest to the Superfund and Homeland Security programs. The standard method for organotin determination has been expanded. A protocol for Method 8081a Analytes was developed to help identify toxaphene and its congeners and address Office of Inspector General concerns.

Bioanalytic techniques that rapidly quantify trace-level contaminants in complex matrices have been developed. Progress has been made on developing immunoaffinity purification for pyrethroids in environmental and dietary samples, developing and evaluating an immunoaffinity chromatography column for atrazine in environmental and dietary samples, evaluating co-planar PCB antibodies and immunoaffinity methods, and evaluating antibodies for PCBs in an immunoaffinity purification approach.

In terms of the Mining-Engineering Technical Support Center, an increased effort was spearheaded by engineering technical support staff, who provided support to 32 mining sites. Personnel also completed numerous demonstrations, publications, presentations, a pilot project on remote monitoring of mining runoff into stream, and a biochemical reactor demonstration comparing different substrates for mine-influenced water treatment. Major projects are ongoing in seven regions. Future plans include many collaborations and partnerships, including Memorandums of Understanding and a Cooperative Research and Development Agreement (CRADA) with several industry partners and collaboration with Region 8.

Because of the acute health affects caused by Libby amphibole asbestos, there is much political attention on and an urgent need for research near the contaminated vermiculite mine in Montana. NHEERL, in collaboration with Region 8, will perform *in vitro* and *in vivo* toxicity studies, with a plan to investigate cardiovascular toxicity at a later date. Dr. Wentsel described the asbestos samples that NHEERL will study in coordination with the National Toxicology Program. Two other sites in Region 10 also will be investigated. Additional asbestos exposure research is examining the resuspension issue (i.e., amounts in soil or carpet, which activities lead to resuspension and inhalation, etc.). A field sampler is being validated, and field studies in Regions 8 and 10 are planned.

Dr. Wentsel highlighted the number of requests that each of the eight ORD technical support centers receive and explained that there have been funding pressures on the program during the last 2 years. He also presented a graph depicting the various technologies evaluated at the Engineering Technical Support Center and highlighted the technologies and issues reviewed at the Ground Water Technical Support Center. Training on capture zone analysis for pump and treat systems was completed in Regions 1 and 7, and a workshop on monitored natural attenuation of inorganic contaminants in ground water was held for Regions 1, 4, 5, and 8. Several multimedia documents are being finalized.

<u>Oil/Underground Storage Tanks/Vapor Intrusion</u>
*Dr. Fran Kremer, EPA/ORD/NRMRL*

Dr. Fran Kremer described research regarding Leaking Underground Storage Tanks (LUSTs), the goal of which is the prevention and control of pollution at LUST sites by properly characterizing fuels and release sites and developing effective risk management approaches. This involves three areas: (1) fuels analysis to understand current and future shifts in supply; (2) improvement of fate and transport understanding via the use of models incorporating defining characteristics of releases; and (3) development of treatment options anticipating fuel composition changes and the nature of sites where releases will occur. EPA is coordinating with other affected agencies, such as the Department of Transportation (DOT) and DOE.

The fuels analysis study involves investigation of the components in fuel that impact fate and transport, such as seasonal and geographic distribution. ORD is working with intra- and inter-agency workgroups (e.g., DOT, DOE) to develop alternative fuel options and anticipate fuel changes. The fate and transport work involves laboratory and field efforts to further reduce concentrations and render potable water. ORD works with states regarding their concerns about ethanol impact behavior and hydrocarbons in fuel. One concern is identifying how the behavior of a given gas station affects various factors such as plume, drinking water supply, development and movement of contaminants, ground water, and so forth. ORD is working with states and regions to develop dynamic model source zones. For *ex situ* treatment, a patented Biomass Concentrator Reactor was developed in partnership with industry for the effective treatment of oxygenates to meet drinking water standards. For *in situ* treatment, better characterization and modeling has resulted in better definition of source and more effective cleanup. Dr. Kremer described several

impacts and outputs of the LUST research, including decision-support tools, publications, presentations, workshops, and training. Researchers are routinely asked by states to work with them to solve problems; ORD combines these requests with research. Clients include OSWER, the Office of Underground Storage Tanks, the Office of Emergency Management, the Office of Air Quality Planning and Standards, the Office of Water, DOT, DOE, state environmental agencies, the Association of State and Territorial Solid Waste Management Officials, and the environmental consulting industry.

Vapor intrusion research is conducted in regard to underground storage tanks, the Resource Conservation and Recovery Act (RCRA), and Superfund. There is more attention with respect to contaminated sites and the development and redevelopment of adjacent properties, which are impacted by decisions about the contaminated site. Better decisions on the re-use of properties are needed. The range of work in this area includes the development of sampling methods, tools regarding indoor vapor intrusion, and less costly alternatives. Laboratories are validating the approaches. The research has resulted in several reports, a workshop, and an outreach program.

Oil spill research in Cincinnati, Ohio, and Athens, Georgia, investigates the fate and transport of spills and develops risk management approaches to respond to spills on inland and coastal waterways and shorelines. This research includes development of practical solutions to mitigate the impact on freshwater and marine environments and development of testing guidelines addressing environment, type of oil, and the agent for remediation. Outputs include: (1) models that incorporate the composition and properties of spilled oil, natural dispersion, emulsification, weathering, and the effectiveness of control strategies; (2) protocols for product testing (e.g., dispersant effectiveness, bioremediation agents, surface washing agents); and (3) protocols used to identify products for the National Contingency Plan Product Schedule, which assists emergency responders. ORD has accomplished a great deal in terms of developing standardized procedures and methods for the numerous companies, vendors, and products. Oil spill research has resulted in numerous journal articles and presentations.

## Goal 2 Progress

Materials Management/Resource Conservation
*Ms. Patricia Erickson, EPA/ORD/NRMRL*

Ms. Patricia Erickson explained that materials management issues include materials assessment for disposal and landfills. At the time of the 2005 BOSC review, an important issue was disposal of prions in diseased animal carcasses. Disaster debris, especially debris related to Hurricane Katrina, now is another important topic with two key questions: Can shredding/grinding safely reduce debris volume with possible recovery of recyclables? Can incineration safely destroy debris, including asbestos-containing materials? A related burn and grind disaster debris project involves collaboration with three ORD laboratories and centers, three program offices, Region 6, the Louisiana Department of Environmental Quality, the U.S. Army Corps of Engineers, the Federal Emergency Management Agency, the Occupational Safety and Health Administration, and the National Institute for Occupational Safety and Health as well as CRADAs with equipment suppliers.

Another materials management issue is investigation of an alternative control method to remove asbestos. Regulatory requirements call for asbestos removal before building demolition; a safe, less expensive alternative may stimulate more Brownfields development. Tests showed that a foam spray used on the building before and during demolition controls asbestos fibers so that they do not become airborne. This method, in the first field test, was five times faster and approximately 50 percent less costly than the standard method. Two similar projects are underway, and data analysis will continue with extensive peer review. Reports should be forthcoming within 6 months to 1 year.

## Public Comment

Ms. Drumm called for public comment at 11:25 a.m. No comments were offered.

## Goal 2 Progress (continued)

Materials Management/Resource Conservation (continued)

A recent landfill effort involved field tests of a methodology to demonstrate the functional equivalency of alternate covers. This work was characterized by extensive outreach and technology transfer. Many publications have come out of the landfill cover research. Ms. Erickson highlighted another landfill project in which EPA commissioned the National Academy of Sciences to examine the assessment of remaining containment issues. Another landfill project involved hot leachate from Countywide landfill; ORD collaborated with Region 5 and the State of Ohio on this project. Another landfill issue is pharmaceutical disposal, which also affects wastewater treatment systems. Although this is not officially part of the research program, it is timely and topical and must be addressed. A doctoral student used EPA facilities to write his dissertation on the fate of pharmaceuticals in landfills.

Researchers always are looking for a more integrative waste management approach. Although program offices are organized by air, water, and land, EPA recognizes that problems in one area may affect another (e.g., landfill leachates can affect water) and is cognizant of interlinkages. Various program offices are examining such problems as a whole.

Alternative cover research is complete. Vegetative covers have increased the 2005 estimated savings of $155 million to more than $200 million in savings at 35 sites. This project involved extensive outreach and collaboration from its initiation and has resulted in an international conference presentation and a journal article. This technology has been exported internationally.

In terms of landfill bioreactors, field studies were conducted at three sites. The bioreactors accelerate degradation of waste. As energy and greenhouse gas portions of EPA's portfolio increase, more work may be completed in this area. This effort was highly leveraged with several CRADAs; involving the owners and operators in this manner allowed for a more substantial and robust research effort. A training course also was developed, and a forthcoming substantial report will describe the design, engineering, and operation of the bioreactors.

Resource conservation is a relatively new research area. This area assesses beneficial use and Brownfields and land reutilization. Assessment tools to evaluate beneficial use, appropriate disposal, and remediation were investigated for use in multiple areas (e.g., disaster debris, pharmaceutical waste, etc.). These capabilities are being migrated to nanotechnology research.

The Brownfields Program has been operating for 5 to 10 years and began as the transfer of knowledge about cleanup and re-use from Superfund and RCRA corrective actions to the less-contaminated Brownfields. There are documents on common site types, and local groups attempt to simulate redevelopments. There are international workshops on overcoming barriers, and tool development to help project teams focus questions and resources. Within the last 2 years, the Sustainable Management Approaches and Revitalization Tools-electronic (commonly known as SMARTe) decision-support system was developed, and there has been extensive partnership and outreach. Brownfields was funded by the program office through fiscal year 2007, but financial support is waning, so a transition in which others (e.g., non-governmental organizations) will take the lead is underway.

Emerging Materials

*Dr. Eric Weber, EPA/ORD/National Exposure Research Laboratory (NERL)*

Dr. Eric Weber explained that nanomaterials are emerging contaminants and define ORD's research program. Research money became available in 2007, and the effort has moved from the planning to the implementation stage, with a meeting of all principal investigators planned for later this year.

Nanotechnology is generally defined as the ability to create and use materials, devices, and systems with unique properties at the scale of approximately 1 to 100 nm. Because of this very small size, quantum effects dominate, and materials have unique properties as a result of substantial changes in surface area per unit volume. Companies have been asked to re-register products based on size; there currently are 300 products on the market, and this number will increase substantially.

The goal of the research is to evaluate and assess the extent to which nanomaterials and products impact the environment and human health. A smaller portion of ORD's research will focus on beneficial environmental applications, such as more effective control technologies and enhanced production processes that reduce emissions and releases of conventional pollutants. The three guiding documents for ORD's research program are the National Nanotechnology Initiative, the EPA Nanotechnology White Paper, and the Nanomaterial Research Strategy. The four research themes are: (1) sources, fate, transport, and exposure; (2) human health and ecological research to inform risk assessment and test methods; (3) risk assessment methods and case studies; and (4) preventing and mitigating risks. The initial focus of ORD's program is the first theme—sources, fate, transport, and exposure. Dr. Weber highlighted the key science questions that will be addressed under this focus.

NHEERL already is performing work in the area of human health, focusing on *in vitro* toxicity. In terms of the third research theme (risk assessment methods and case studies), some case studies already have been completed and science gaps have been identified for future work. A case study on nanotubes was canceled because of lack of information, but the National Center for Environmental Assessment may study this area. In terms of preventing and mitigating risk, the key science question is: What technologies or practices can be applied to minimize risks of engineered nanomaterials throughout their life cycle and to use nanotechnology to minimize other risks? NRMRL is investigating this issue, which will become increasingly important. Early research products include a case study, journal articles, and the upcoming investigators meeting.

**Subcommittee Discussion**

*Dr. Charlie Menzie, Exponent, Inc., Subcommittee Chair*

Dr. Menzie thanked EPA staff for their presentations and opened the floor to questions from the Subcommittee members.

Dr. Siegrist asked about the sediment classification strategy from the first presentation. He asked whether research and development accommodate types and circumstances of contaminated sediment, knowledge, and impact or whether it was more *ad hoc* based on technical assistance, opportunities, access, and timing. Dr. Hoff responded that it is not *ad hoc*, but the contaminated sediment research plan submitted to the BOSC in 2005 included technical assistance. Much is planned with the program office and sediment management workgroup on national needs for remediation.

Dr. Haber mentioned that the nanomaterials presentation mentioned health effects and a focus on *in vitro* studies and asked why this preference was made over *in vivo* studies. Dr. Weber answered that initial studies are *in vitro*, and the research will progress to physiologically based pharmacokinetic modeling and *in vivo* studies. Dr. Wentsel added that there is a collaboration with NIEHS to perform more complex studies based on initial EPA results.

Dr. Clark commented on the value and role of the technical support centers, which provide short-term responses with quick turnaround. Technical support centers have very practical applications and real world results (e.g., Hurricane Katrina response). He would like to see the technical support centers preserved. Dr. Wentsel agreed and stated that defending the technical support centers is an internal challenge. There is a connection to applied science and interactions with regional site managers and scientists, and people have been responsive to this program.

Dr. Clark commented that other BOSC reviews have struggled to follow the research plan, deliverables, and outputs and, subsequently, evaluate the research outcomes in which a difference has been made. This program is very aware of the impact of its outcomes.

Dr. Menzie began discussion on the preparations for the face-to-face meeting. The outline for the report is straightforward. Other mid-cycle reports essentially are extended discussions of performance regarding the charge questions. This Subcommittee's report will be structured by the charge questions. Because there are many areas to consider, the most efficient approach is to divide the topics among members as areas of emphasis. There will be three teams of two members. Dr. Menzie reiterated the assignments he had mentioned during the beginning of the teleconference and stated that these assignments were open for discussion. There are clear topics of interest for each Subcommittee member within the Land Research Program. One approach to writing the report is to maintain this emphasis but encourage other Subcommittee members with a special interest to contribute and provide feedback to the lead writer regarding these topics (e.g., Dr. Haber on health effects and Dr. Siegrist on treatment and containment technologies). An alternative approach is for members to determine whether there were particular topics raised in the presentations that may not fall under his or her assignment but that he or she should be addressing.

Dr. Siegrist stated that he would like to contribute to the topic of ground water. Dr. Menzie mentioned that he and Dr. Clark were assigned to the ground water team, and it would be a matter of how to divide the material. Dr. Clark will contribute much to this effort but will not be at the face-to-face meeting. As there is a great deal of activity regarding ground water, it may be helpful for Dr. Siegrist to examine the topic and take a subset for his workgroup. Dr. Siegrist will determine which areas under ground water that he would like to cover and e-mail his preferences to Dr. Menzie.

Dr. Haber clarified that workgroups are not being assigned individual charge questions and that all Subcommittee members are contributing to all charge questions along the assigned topics. Dr. Menzie confirmed that this was the case. This will increase coherence, and members can focus on the progress made in particular topic areas and contribute to each charge question. Dr. Haber stated that she would like to contribute to topics covered in Dr. Wentsel's presentation; she will examine these materials and e-mail Dr. Menzie the topics on which she would like to contribute.

Dr. Clark stated that he was comfortable with his assignments, and he also would like to contribute some thoughts on nanotechnology.

Dr. Menzie recommended that Subcommittee members arrive at the face-to-face meeting with their premeeting comments and thoughts written down. Ms. Drumm agreed that, based on past mid-cycle reviews, this would help the discussion. There are 3-4 hours of discussion on the agenda for the face-to-face meeting; preparation will lead to a more productive discussion.

Dr. Haber asked if telephone conversations between two Subcommittee members complied with FACA rules. Ms. Drumm stated that two Subcommittee members can discuss issues when not in a public forum. These conversations can occur before the face-to-face meeting and then be discussed at the meeting. Dr. Clark stated that based on his experience, this is a good method. The Subcommittee as a whole then can test the conclusions and characterizations of the workgroups at the face-to-face meeting to ensure that nothing has been missed.

Dr. Menzie stated that he and Ms. Drumm will prepare instructions and guidance about the process and e-mail them to the Subcommittee members. Included in these instructions will be the amended assignments with the incorporation of Drs. Haber's and Siegrist's expertise, following their input.

Dr. Siegrist asked which EPA staff would attend the face-to-face meeting. Ms. Drumm explained that Dr. Wentsel would be at the face-to-face meeting with a few other staff members, and a phone line will be available for others to call in. Per the agenda, there will be 45 minutes for questions and answers. Dr. Wentsel added that a few assistant laboratory directors would be available, and today's presenters may be able to call in. Dr. Wentsel also has asked several program office representatives to be available during the time set aside for questions and answers. If questions arise about today's presentations, they can be answered at the face-to-face meeting.

Dr. Menzie stated that all Subcommittee members should have the agenda for the face-to-face meeting. He briefly reviewed the agenda and stated that the schedule is very concentrated, so advance preparation will be a great help in providing a report-out in the limited amount of time. He asked whether any Subcommittee members had questions or comments about the procedure. As no one had any questions, he stated that the next action is for Drs. Haber and Siegrist to determine the specific subtopics on which they want to focus so that the assignment list can be revised. When this is finished, an e-mail will be sent requesting the development of comments and thoughts to guide the face-to-face discussion. Based on Dr. Siegrist's question during the last teleconference, the charge questions have been modified so that they are more relevant and/or understandable. Dr. Siegrist commented that this was helpful.

Ms. Drumm asked Subcommittee members who have not received their travel itineraries by May 1, 2008, to contact her. Drs. Haber and Siegrist noted that they had been informed that their itineraries were being processed.

Dr. Menzie thanked the Subcommittee members for their time and efforts and adjourned the call at 12:14 p.m.

**Action Items**

- ✧ Dr. Siegrist will determine which areas under ground water that he would like to cover and e-mail his preferences to Dr. Menzie.
- ✧ Dr. Haber will examine Dr. Wentsel's presentation and e-mail Dr. Menzie the topics on which she would like to comment.
- ✧ Dr. Menzie and Ms. Drumm will prepare guidance on the workgroup process, which will include updated assignments, and e-mail this to the Subcommittee members.

## PARTICIPANTS LIST

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BOARD OF SCIENTIFIC COUNSELORS

**LAND MID-CYCLE REVIEW SUBCOMMITTEE**
**AGENDA**
**Thursday, April 24, 2008**
**10:00 a.m. – 12:00 p.m. Eastern Time**

**Participation by Teleconference Only**
**866-299-3188**
**code: 2025648239#**

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|---|---|---|
| 10:00–10:10 a.m. | Welcome<br>- Roll Call<br>- Overview of Agenda | Dr. Charlie Menzie,<br>Subcommittee Chair |
| 10:10–10:15 a.m. | Administrative Procedures | Heather Drumm,<br>Subcommittee DFO |
| 10:15–11:05 a.m. | Goal 1 Progress<br>- Contaminated Sediments…….<br>- Ground Water……..<br>- Multi (Analytical/Mining/Asbestos)…<br>- Oil/Underground Storage Tanks/ Vapor Intrusion …… | <br>Dale Hoff, NHEERL<br>Bob Puls, NRMRL<br>Randy Wentsel, ORD<br>Kremer/Weaver, NRMRL/NERL |
| 11:05–11:25 a.m. | Goal 2 Progress<br>- Materials Management/ Resource Conservation……..<br>- Emerging Materials…… | <br>Patricia Erickson, NRMRL<br>Eric Weber, NERL |
| 11:25–11:30 a.m. | Public Comment | |
| 11:30 a.m.–12:00 p.m. | Subcommittee Discussion<br>- Preparation for Face-to-Face Meeting<br>- Report Outline | Dr. Charlie Menzie,<br>Subcommittee Chair |
| 12:00 p.m. | Adjourn | |