

**U.S. Environmental Protection Agency
Office of Research and Development**

**BOARD OF SCIENTIFIC COUNSELORS
EXECUTIVE COMMITTEE MEETING**

**Washington, DC
February 11-12, 2002**

Monday—February 11, 2002

Welcome/Introductions

Dr. Jerry Schnoor (University of Iowa), Chair of the Board of Scientific Counselors (BOSC), called the meeting to order at 1:15 p.m. He welcomed Dr. Paul Gilman, the designee for the Assistant Administrator of the Office of Research and Development (AA/ORD) to the meeting and asked the members to provide a brief introduction of themselves for his benefit. He quickly reviewed the meeting agenda, noting that both the Chair and Vice Chair for the National Risk Management Research Laboratory (NRMRL) Subcommittee were not present for final discussion and approval of that report.

Dr. Schnoor welcomed George Alapas, Acting Director of the National Center for Environmental Assessment (NCEA), Elaine Francis (NCER), and Eileen Abt from the National Academy of Sciences (NAS) to the meeting. He explained that Ms. Abt is working on the STAR study undertaken by NAS at EPA's request. Ms. Abt reported that NAS has assembled a 14-member panel to examine the effectiveness of the STAR program. The panel will meet in a public session on March 18 and 19, 2002.

AA/ORD Remarks

Dr. Gilman stated that he has not been confirmed by the Senate, so he is serving at EPA in an advisory capacity to the Administrator. He thanked the BOSC members for their efforts on behalf of ORD, indicating that he served in a similar capacity for the Department of Energy (DOE) examining best management practices for DOE and how the agency measures success.

Dr. Gilman provided a brief description of his professional experience. Most recently, he was employed at Celera Genomics in Rockville, MD, where he was developing an information system for the dissemination of information on the human genome and other genomes. He also has served at the National Research Council (NRC), where he was the director of the life science and agricultural group for 5 years. Dr. Gilman noted that he learned some of what goes on at EPA while serving in that position. Prior to that, he held a position at the Office of Management and Budget (OMB), and served 13 years on Capitol Hill.

In a recent meeting with the Administrator, Gov. Whitman asked Dr. Gilman to identify his long-term goals for ORD. He informed Gov. Whitman that his long-term goal was that EPA's decisions and recommendations would be afforded the same credibility as those issued by the Food and Drug Administration (FDA). Although the Administrator was startled by Dr. Gilman's statement, she began to see its merit after further reflection.

Dr. Gilman noted the importance of third party validation, and he supported the creation of groups like the BOSC to help the Agency set directions and review progress. He stated that one key to sound science is good, early planning. Dr. Gilman pointed out that the Administrator is making an effort to involve ORD earlier in the process to provide input on what knowledge is needed to develop a rule or regulation.

With regard to the BOSC's future activities, Dr. Gilman asked the Board to consider broadening its mission beyond the management of science to include activities such as more traditional peer review of the science and research planning. He noted the importance of early planning in research program development. The BOSC could assist ORD in thinking through its longer term research programs, particularly for those areas that are new to the Agency.

Dr. Gilman mentioned the sensitivity to conflict of interest (COI) at the Agency following the recent Government Accounting Office (GAO) report on EPA's Science Advisory Board (SAB). He asked the BOSC to consider adopting the processes and procedures used by the NRC as they related to COI and balance of bias. Dr. Gilman noted that thousands of experts complete the NRC process and none have objected to the requested disclosure.

Dan Acosta (University of Cincinnati) asked Dr. Gilman to comment on how the President's proposed budget reduction for EPA will affect ORD. Dr. Gilman replied that there was a decline in the science and technology budget; however, the proposed budget for EPA is slightly higher than last year's budget if the Congressional add-ons are eliminated. He pointed out that ORD's proposed budget is actually higher than last year. Dr. Gilman also mentioned the American Association for the Advancement of Science (AAAS) analysis of the proposed budget, which indicated that EPA received the third largest increase in the federal government. He noted that ORD will be receiving a fairly large amount of funding (approximately \$75 million) for homeland security research—primarily decontamination of buildings affected by biological and chemical agents. With regard to performance-based progress, EPA was the highest ranking agency; however, the National Science Foundation received higher ranks for its financial management system, which facilitates paperless grant submission. Dr. Gilman encouraged ORD managers to examine the NSF system and determine if EPA could adopt it. He noted that this would not be an easy task because it would have to be compatible with the Agency's overall financial system.

Dr. Rae Zimmerman (New York University) commented that there was a substantial reduction in the budget for the clean water program. Dr. Gilman replied that he had focused more on ORD's budget and could not comment on the Office of Water's budget. He noted, however, that the President's proposed budget includes most of what ORD requested for water research.

Dr. Schnoor indicated that he had spoken to Dr. Gilman prior to the meeting to discuss the possibility of the BOSC expanding its mission to include review of ORD products and programs. Dr. Schnoor noted that, although the BOSC is a relatively small group (only 14 members), the Board would welcome the opportunity to do more for ORD. Because the BOSC members manage a considerable amount of research, they can provide valuable assistance to ORD's Laboratories and Centers. Dr. Schnoor noted that the BOSC wants to maintain a long-term relationship with the Laboratories/Centers. He stated that the BOSC needs a Web site to facilitate communication and dissemination of materials among the members, and to elevate the visibility of the BOSC.

Dr. Bonnie McCay (Rutgers) asked if there would be a conflict between the BOSC and the SAB if the BOSC's mission is expanded. Dr. Gilman responded that he did not envision any conflicts between the BOSC and the SAB. He noted that there are a number of advisory groups other than the SAB that review Agency products and programs. Dr. Gilman stated that there is no shortage of work; the SAB does not have the resources to complete all of the tasks that have been requested by the Agency. In addition, the proposed COI procedures may add 30 percent to the time it takes to conduct a study. He noted that the NRC experience indicated that studies that were well organized and planned took less time to review than those that were not.

Dr. Schnoor suggested that the members discuss the BOSC charter, which must be renewed in March 2002. Dr. Donald Mattison (Columbia University) noted that most of the future directions identified by the Agency are chemically based (e.g., particulates, sediments). He asked about the inclusion of biologics in future efforts. Dr. Gilman replied that there has been little emphasis on biologics because the Agency's efforts are driven by a few laws that are very descriptive (e.g., Clean Air Act). However, the Agency's research agenda is changing. It is being driven by the needs of the regulatory programs. He cited the anthrax contamination of the Senate office building as an example of how the research agenda is shifting. The emergency response personnel had a limited number of tools to decontaminate the building. Dr. Gilman would like ORD to be the best weapon in the arsenal to address these new problems. How can ORD be mobilized in instances where our Nation faces something that has not been part of the recent research agenda? This will be part of ORD's efforts with regard to homeland security. ORD should be thinking more broadly, looking beyond today's newspaper headlines to focus on issues that pose the greatest risk to human health.

NRMRL Subcommittee Report Discussion

Dr. Schnoor stated that Mitch Small (Chair of the NRMRL Subcommittee) was unable to attend the meeting. He added that Elaine Dorward-King (Rio Tinto Borax) has accepted a new position and also was unable to attend. Dr. Dorward-King has indicated that she would like to remain on the BOSC, despite her recent change of employment. Because of the absence of the Chair and Vice Chair, Dr. Schnoor was reluctant to approve the report. He asked if there were any comments on the revised draft report.

Dr. Jim Bus (Dow Chemical Company) commented that the reports are in different formats. Should there be a common format for the reports? Dr. Ann Bostrom (Georgia Institute of Technology) noted that the reports should include a table of contents. She thought the NRMRL report was difficult to read. Dr. Zimmerman said that there are several fundamental organizational issues to resolve. She found it difficult to organize the report. There were many questions but only a few topics. Dr. Bus noted that the questions were clustered in the National Health and Environmental Effects Research Laboratory (NHEERL) report. Dr. McCay stated that the NCEA report addresses each question separately. This makes the report redundant and difficult to follow. Should the reports be reorganized? Dr. Zimmerman commented that it was difficult to incorporate the section on how the Laboratory/Center has responded to the recommendations from the previous BOSC review. It was placed in an appendix in the NCEA report. Should the recommendations be in bold text following each question and be listed at the end of the report?

Dr. Schnoor commented that the NRMRL report adopted a structure that differs from previous BOSC reports. It describes the Laboratory's response to each question followed by a critique prepared by the Subcommittee. Although this approach makes the report bulky, it clearly separates the Laboratory responses from the BOSC's comments. Dr. Schnoor stated that the reports need not be identical. Each should be logically organized and clear. Shirley Hamilton (NCER), Designated Federal Officer for the BOSC, indicated that she had received a more recent draft from Dr. Small that morning but did not have time to circulate it to the members before the meeting.

Dr. Herb Windom (Skidaway Institute) found himself trying to match the NRMRL report with the NHEERL report to determine if the NHEERL Subcommittee had addressed some of the important issues mentioned in the NRMRL report. He suggested that it may be helpful if the reports were organized similarly. He commented that the measures of success should be similar and the BOSC's recommendations should be consistent from one report to the next. Dr. Windom also noted that there are a number of themes common to all or several of the reports. He suggested that those items be addressed separately by the BOSC in more detail. Dr. James Johnson (Howard University) agreed with the suggestion of teasing out the common themes. He suggested highlighting the best practices among the

Laboratories/Centers and cross-cutting issues that are preventing the Laboratories/Centers from performing at the highest level.

Dr. Schnoor proposed adding a common preface to all five reports that describes the procedures employed by the BOSC in the review. Each report also will include an executive summary prepared by the Subcommittee. He also endorsed the suggestion of highlighting the recommendations and conclusions in bold text and listing them at the end of each report. Dr. Windom asked that a list of acronyms be included in each report. He also suggested that the recommendations be numbered sequentially in the text and in the list. Dr. Bostrom pointed out that each Subcommittee had a standard set of questions, but the questions are organized and numbered differently in each report. Dr. Schnoor replied that the Subcommittees grouped the questions differently and he did not think it was necessary to number the questions the same in each report.

Dr. Schnoor suggested that the discussion of the NRMRL report be tabled until a conference call for which Dr. Small is available can be scheduled. The report can be approved following final comments during that conference call.

NCEA Subcommittee Report Discussion

Dr. Zimmerman, Chair of the NCEA Subcommittee, noted that there had been a number of revisions to the report since the December teleconference. She incorporated the comments received during that call as well as those provided by Dr. Alapas with regard to factual errors and inconsistencies. Dr. Zimmerman summarized NCEA's key accomplishments. Dr. Windom noted that the NCEA report mentions the 16 Multi-Year Plans (MYPs) on page 2; the NHEERL report refers to 14 MYPs. He expressed some concern about such inconsistencies among the reports. He suggested that a list of the 16 MYPs be included in each report. Dr. Schnoor agreed that each report should include the list and place an asterisk by those reports for which the Laboratory/Center is the lead or to which it contributes. Dr. Zimmerman noted that Dr. Alapas was very helpful in explaining the different roles of NCEA in the MYPs. She noted that he provided the Subcommittee members a table that listed the MYPs, their status, the lead author, participating members, and the members of the ORD Executive Guidance Group (EGG). Dr. Schnoor asked if that table could be circulated to the BOSC members. Ms. Hamilton replied that she would distribute the most recent version of the table to the members. Dr. Schnoor stated that each report should include a table that lists all 16 reports and indicates with an asterisk those reports for which the Laboratory/Center is the lead or to which it contributes. Dr. Bostrom stated that the Laboratory/Center roles in the MYPs and the ORD and EPA strategic plans should be addressed by the BOSC. Dr. Alapas commented that the MYPs have helped ORD improve planning and budget decisions. They would prevent, for example, the elimination of funding for the third year of a 3-year project. Dr. Schnoor asked how many MYPs are assigned a National Program Manager. Dr. Alapas replied that there are four with National Program Managers—endocrine disruptors, global climate, drinking water, and particulate matter.

Dr. Zimmerman stated that the first recommendation involves aligning the update of the NCEA Strategic Plan with revision of the ORD Strategic Plan. She noted that NCEA's strategic plan is extensive and needed to coalesce the activities across the 16 MYPs. Dr. Alapas commented that the members on the writing groups for the 16 MYPs can write NCEA's vision into these plans. There will be a better fit with the plans if NCEA has already articulated a vision of what it is and what it wants to be. With regard to the second recommendation on page 3, Dr. Bus noted that NCEA should track how the budget is spent versus the proposed budget—track progress against intentions. Dr. Zimmerman commented that the Government Performance and Results Act (GPRA) is not providing that tracking function. Dr. Alapas noted that NCEA has written chapters on how to reduce the uncertainty of risk assessments. He acknowledged that NCEA should ensure that the planning committee has a clear understanding of the research needs. He noted that one of the outcomes of September 11 will be better tracking. Dr. Alapas noted that the Agency also needs to examine what was not completed because of the tradeoffs in

responding to the September 11 tragedy. He agreed that the federal government should be prepared to respond to future emergencies in a more coordinated manner.

Recommendations 4, 5, 6, and 7 focus on Laboratory and Center integration. The BOSC recommends that NCEA articulate its process for selecting risk assessments to undertake. The BOSC also recommends that NCEA identify its areas of focus, with regard to the Integrated Strategic Plans or MYPs, for the next 5 to 10 years. In addition, the BOSC recommends that NCEA integrate risk management and risk assessment, and be more proactive in identifying clients for its work products. With regard to Recommendation 6, Dr. Johnson suggested that there be consistency in the recommendations in the reports. The BOSC recommends that EPA go beyond the “Understanding Risk” report. Dr. McCay noted that “Understanding Risk” brought the stakeholders into the process. Who is formulating the next generation of risk assessment? Dr. Bostrom commented that people want empirical evidence that the risk assessment process is worth it. She noted that the report refers to clients/audiences in several places. She suggested adding a recommendation that NCEA should determine the clients/audiences with which it is trying to communicate. Dr. McCay noted the shift to a client paradigm from a risk paradigm.

Recommendations 8 and 9 refer to divisional integration and the risk paradigm. She noted that NCEA is highly specialized. Rotations, details, and retreats could help the divisions communicate with one another. Dr. Bus asked if NCEA management had developed principles and implemented process checks to examine internal consistency. He commented that Dow frequently falls into that trap—implementing different processes in different plants, when they should be the same whenever possible. For example, following September 11, each chemical company began to establish its own security procedures. Now, the chemical industry is trying to identify a set of principles for all chemical companies. Dr. Alapas stated that NCEA is looking for advice on how to standardize basic methods.

Recommendation 10 states that NCEA should explore and track measures of the extent, diversity, and nature of its intra-ORD and intra-EPA activity. Recommendation 11 concerns the need for more social and behavioral scientists at NCEA to further the development of guidance in risk communication. Recommendations 12, 13, and 14 refer to achieving and maintaining a balance between human health research and ecological research. The BOSC endorsed NCEA’s practice of establishing interdisciplinary teams, with human health risk assessors and ecological risk assessors working together on the same assessments. The BOSC urged NCEA to continue and increase its investment in ecological risk assessment. In addition, the BOSC encouraged NCEA to continue to advance the state-of-the-science and practical applications in integrated assessment. Dr. Johnson asked what NCEA should use to determine that balance. Dr. Zimmerman replied that it could be determined at the project level. Dr. Schnoor noted that the report did not include a prescriptive percentage of ecological research. Dr. Johnson expressed some concern that all the reports should be consistent with regard to the recommendations concerning the balance between human health and ecological research. Dr. Schnoor commented that EPA should have the largest national focus on ecological research because it is the only agency conducting ecological risk assessments. Dr. Bus supported Recommendation 13—it acknowledges that EPA has spent considerable effort on chemical stressors and needs to focus on additional stressors. Dr. Bostrom suggested that an example be added to explain how this could be accomplished.

In Recommendation 15, the BOSC suggested that NCEA describe its assessment process. The BOSC also recommends (Recommendation 16) that NCEA go beyond counting hits on its Web site. NCEA should determine who uses its Web site and use this information to improve the effectiveness of its Web site and other outreach efforts. Dr. Bus asked if NCEA had adequate funding to maintain the Integrated Risk Information System (IRIS). He explained that IRIS provides consensus values on the long-term and chronic effects of 542 chemicals. Dr. Bus noted that numerous individuals rely on IRIS data; if that information is outdated, it could create problems.

Recommendations 17 and 18 involve improving communications. The BOSC recommends that NCEA provide more systematic information about how its staff members target various channels to communicate

their work and the impact of those communications. Also, the BOSC recommends that NCEA design its communication strategy around its target audiences. Dr. McCay noted the sentence on page 12 that reads: “NCEA must absolutely avoid taking on a bigger role and diverting resources needed for science toward this end.” Did the Subcommittee intend the wording to be so strong? Dr. Zimmerman replied that one member was very concerned about this issue. With regard to performance, she wondered if the BOSC could identify some organizations against which to benchmark NCEA.

Dr. Bus questioned the wording of the sentence on page 13: “NCEA has specifically mentioned its difficulty in explaining the significance and meaning of risk characterization to other areas of ORD.” He noted that if this is true, there is a need to uncover the root cause of this problem. If NCEA cannot explain risk characterization to others in ORD, then it will be even more difficult to explain it outside the Agency. Dr. Alapas clarified the concerns expressed during the site visit, explaining that the individuals reviewing and approving budgets favored wet laboratory projects over risk characterization efforts. Dr. Bus noted that Dr. Alapas’ explanation was much clearer than the statement in the report.

With regard to measures of success, Dr. Zimmerman thought the BOSC could assist NCEA in honing in on some evaluative measures. The key is consistency over time, which will require significant resources. She noted the need for a hiring strategy within NCEA, based on the number of individuals who are eligible for retirement. Dr. McCay pointed out a contradiction with regard to the communications area in the report. The third paragraph on page 15 and the third paragraph on page 18 contradict pages 12-13.

Dr. Schnoor thanked Dr. Zimmerman for her overview of the revised report and asked Dr. William Chameides (Georgia Institute of Technology) to assist him with final vetting of the report. Dr. Chameides agreed, and Dr. Schnoor asked Beverly Campbell (SCG) to assist with final formatting of this report as well as the remaining reports to ensure a more consistent format. Ms. Campbell agreed to provide this assistance.

Dr. Schnoor asked the BOSC members to approve the NCEA report subject to eliminating the contradiction identified by Dr. McCay and final vetting. The report was approved unanimously by the BOSC.

NCER Subcommittee Progress Report

Dr. Johnson, Vice-Chair of the NCER Subcommittee, provided a brief report of the Subcommittee’s progress. The site visit was conducted on January 23-24, 2002, at NCER’s office in Washington, DC. Dr. Johnson identified the five top messages that will be included in the NCER report:

- ❖ NCER needs to move forward in completing and implementing its strategic plan. The plan should define NCER’s customers as well as the unique activities it performs.
- ❖ NCER should expand its vision of benchmarking. NCER’s activities should be benchmarked against several different organizations that perform similar activities (e.g., National Institute of Environmental Health Sciences, NSF, petroleum industry, chemical industry).
- ❖ NCER should document its activities. This documentation should demonstrate transparency in its decision processes (grant selection), describe the uniqueness of the Center, and highlight its accomplishments and results.
- ❖ NCER should ensure that there is balance in the Requests for Applications (RFAs). Because there is too much to do with too little money, the Center’s strategy should be to optimize the balance between the RFAs and the available funding.

- ✧ NCER should streamline administrative tasks to improve efficiency, particularly with regard to the peer review process, and develop appropriate metrics.

Dr. Bostrom, who attended the NCER site visit, expressed some concern regarding NCER's peer review approach. She thought it lacked the intellectual infrastructure used by NSF. Because NCER separates the peer review from the Project Officers (POs), who possess the expertise, the reviews are managed by administrators. Ms. Francis explained that NCER has been encouraged to separate the POs from the review process. Dr. Johnson noted that the National Aeronautics and Space Administration (NASA) has adopted NCER's peer review process.

With regard to balancing the RFAs with the available funding, Dr. Schnoor commented that NCER is funding about 15-16 percent of the applications it receives; NSF funds approximately 20 percent. Dr. Bostrom pointed out that, for the most visible programs at NSF, it funds about 6-7 percent; the overall average is 20 percent. Dr. Schnoor noted that the National Institutes of Health (NIH) funds approximately 30 percent of the applications received. Dr. Johnson stated that a low funding rate discourages researchers from submitting applications. Dr. Schnoor agreed that EPA's rejection rate should exceed NSF's rejection rate.

Dr. Bostrom indicated that she has submitted some comments regarding subcontracting the peer review activities to Dr. James Clark (Exxon Mobil Research & Engineering Co.) prior to the meeting. Dr. Johnson commented that NCER prefers not to use a subcontract for the peer review because EPA would have no input with regard to final selections. Dr. Bostrom added that the STAR review examined the peer review process in some detail and she suggested that the Subcommittee members review that report. Dr. Johnson replied that the Subcommittee members have received that report. He concluded his update by stating that a draft report will be completed by March 31.

Next Steps/Next Meeting

Dr. Schnoor asked if the next meeting should focus on the MYPs. Do the members want to review the same two reports (i.e., the Water Quality and Pollution Prevention Reports) reviewed by the Research Strategies Advisory Committee (RSAC)? Should we invite ORD staff to the first day of the next meeting to present the reports, and then prepare a letter report from the BOSC that would be submitted to the AA/ORD? Dr. Johnson noted that there appears to be a diminishing need for the Laboratory/Center strategic plans since development of the MYPs. Dr. Zimmerman disagreed, stating that she believes those reports are more important now. Dr. Bus noted that NHEERL has taken a different approach with its strategic plan. NHEERL's plan creates a culture within the Laboratory that is needed to conduct the research identified in the MYPs. It describes the staff and resources NHEERL needs to implement the MYPs. Dr. Johnson agreed that the Laboratory/Center strategic plans should concentrate on process—culture, staff, resources, flexibility, etc.

Dr. Schnoor asked if the BOSC should examine all 16 MYPs. He suggested reviewing the table on the MYPs to be distributed by Shirley Hamilton before the next meeting. ORD staff will be invited to the next meeting to describe and discuss the plans. Dr. Schnoor asked how EPA determined which programs need a National Program Manager. Ms. Francis replied that EPA uses a number of criteria including budget size, visibility, the amount of external (outside EPA) coordination required to implement the program, and the degree to which the program cross-cuts different areas. There are National Program Managers for particulate matter, drinking water, global change, endocrine disruptors, and Environmental Monitoring and Assessment (EMAP).

Dr. McCay commented that the MYPs were not mentioned at the NERL site visit. She had a difficult time determining how the MYPs fit into the Laboratory's activities. Ms. Francis pointed out that there is a plan on ecological risk assessment and restoration.

Dr. Schnoor expressed his reluctance to review the same plans reviewed by the RSAC. He preferred to examine all 16 MYPs, to review who is leading what and why, and to discuss how the MYP efforts should be dovetailed with the Laboratory/Center strategic plans. Dr. Schnoor suggested that the BOSC invite Dr. Gilman and whatever ORD staff he chooses to present the MYPs at the next meeting. Dr. Johnson thought the BOSC should ask the ORD staff to translate the MYP into what they will do on a day-to-day basis. Because a number of laboratories do not have strategic plans, the ORD staff should explain how they plan to use the MYPs to develop their own strategic plans.

Dr. Bostrom asked what homework the BOSC members should do before the next meeting. Dr. Schnoor suggested that the members review the table to be distributed as well as the MYPs that are available. He asked that Ms. Hamilton circulate the Pollution Prevention and Water Quality MYPs, Executive Summaries of the other reports (those that are available), and the table (the latest list from the Office of Science Policy) to the BOSC members prior to the next meeting. Dr. Schnoor explained that the BOSC's goals will be to understand the MYP process, and determine how the MYPs articulate with the strategic plans/planning process. For those Laboratories/Centers that have not developed plans, they should describe the process they plan to use to implement the research identified in the MYPs. The BOSC should examine how EPA selected the 16 topics. Why only 16? Do these 16 MYPs cover everything? How will the Agency sunset the research in these plans? Dr. Chameides asked Dr. Schnoor to distribute to the members a statement of the goals for the MYP review. Dr. Bostrom mentioned that Dr. Peter Preuss (NCER) has presented to the BOSC several slides pertaining to the MYPs. Dr. Schnoor noted that those slides are included as an attachment to the November 2001 meeting summary. Dr. Bostrom asked if there is a document that describes the objectives of the MYPs and the strategy for creating the list. Dr. Schnoor agreed to determine if such a document exists and, if so, distribute it to the members. Dr. McCay stated that NERL postponed completing its strategic plan so that it could be coordinated with the update of the ORD Strategic Plan. NERL focused instead on its annual plans and GPRA goals. Her Subcommittee thought the Laboratory provided a convincing argument for waiting to complete the plan.

Dr. Zimmerman suggested that environmental security be a topic at the next meeting. Dr. Schnoor was concerned that the agenda for the next meeting may not allow time for such a discussion, but he agreed to include it if time allows.

Dr. Schnoor indicated the need to prepare a list of nominees for spring 2002 new appointments. He noted that the list generated by the previous Nominations Subcommittee, which was chaired by Dr. Mitch Small (Carnegie Mellon University) could be circulated to the BOSC members for consideration. Dr. Johnson suggested adding names to that list based on input from the current BOSC members. Dr. Bus agreed with the suggested approach, but Dr. Bostrom expressed some concern about limiting the outreach for nominees. She supported the process that was employed by Dr. Small's Subcommittee. Dr. Schnoor said that he would prefer to start with the list generated by the Subcommittee and add names for consideration. Dr. Bostrom suggested that the Nominations Subcommittee draft procedures used for identifying nominees. Ms. Hamilton noted that personnel issues should be discussed in closed session, which must be approved by the Administrator. Dr. Bus pointed out that the criteria for nominations should be expertise, balance of the Board, and diversity. It was agreed that no Nominations Subcommittee would be created. Ms. Campbell agreed to circulate the list generated by Dr. Small's Subcommittee to the BOSC members. The BOSC members will review the existing list used for previous nominee selection and add any names of qualified individuals who would be an asset to the BOSC. Dr. Schnoor asked the members to review the list and submit any additional names (with resumes) to him before the May meeting. He pointed out that Dr. Gilman will make the final selections based on the narrowed list provided by the BOSC. Dr. Schnoor suggested adding some of the members of the Laboratory/Center Subcommittees to the list.

A conference call to approve the NRMRL Report, and review the NHEERL, NERL, and NCER Reports was scheduled for March 26, 1:00 - 3:00 p.m. Eastern Standard Time. The call-in number is 202-260-1015, and the access code is 9960#. The next BOSC meeting will be held May 13-14, 2002, in

Washington, DC. The meeting will convene at 1:00 p.m. on May 13. Ms. Hamilton agreed to verify that the AA/ORD is available on those dates. The final vote on approval of the NHEERL, NERL, and NCER Reports will be included on the May meeting agenda. The subsequent BOSC meeting will be held September 23-24, 2002. Dr. Bostrom indicated that a rough draft of the Communications Subcommittee Report may be available at the May meeting.

Metrics of Success for EPA/ORD

Dr. Schnoor reviewed some key questions concerning performance measures that were presented at the November meeting. He also reminded the BOSC members of ORD’s five strategic goals. He indicated that he had reviewed the performance measures responses submitted by the members on the second day of the November meeting and summarized them in an overhead. He noted the need for dove-tailing the MYPs and the Laboratory/Center strategic plans. The MYPs have quickly become ORD’s method for coordinating and planning its science by major thrust area. However, the need for overall strategic planning remains. ORD’s Laboratories and Center should have a plan that supports the ORD Strategic Plan, which, in turn, supports the EPA Strategic Plan. Dr. Schnoor highlighted the need for top-down and bottom-up planning:

ORD (AA’s Office) ↔ Laboratory/Centers Plans and Division Plans ↔ MYPs (integrate efforts on science problem) ↔ Individual Research Projects ↔ Individual PIs and Bench Scientists (personal plans)

Dr. Schnoor stated that the Laboratory/Center Strategic Plans should embody goals, objectives, strategies, and tracking of target indicators. With regard to measures of success, he indicated that the BOSC should not determine the measures of success and target indicators for ORD; these properly should be determined by ORD. The BOSC members can make suggestions regarding measures of success and target indicators based on discussion and their own experiences. He noted the need for a balance between measures of “quantity” and “quality.”

Target indicators are needed on both outputs and outcomes, and they must be determined by the individual Laboratory/Center in concert with others. The Laboratory/Center should identify target indicators that can be tracked and they should be updated annually. Target indicators are needed for management goals, research goals, personnel, and customer satisfaction (survey instruments are needed).

To measure the impact of ORD, indicators of productivity (quantity) and quality (more subjective) are needed. Different indicators are needed for both outputs and outcomes. It was suggested that the Logic Model may be a good way to present the information flow of the research process. The milestones identified in the MYPs are a good measure of accomplishment and, hopefully, impact on the Agency’s mission. Dr. Schnoor provided the following table identifying performance measures for outputs and outcomes.

Inputs	Outputs	Outcomes
Budget authority, expenditures	GPRA goals, reports, publications	GPRA measures, human health
FTE scientists and staff	Tools, patents, Web sites (hits)	Decreased emissions, P2
Physical infrastructure	Programs (codes), advice, quantity and quality	Knowledge of ecosystems quality

Dr. Schnoor pointed out that ORD has unique goals and objectives within the Agency and the Government. Because EPA is a mission Agency, relevancy is very important to ORD. However, being the organization for environmental science and contributing to the body of scientific knowledge also are major goals. Dr. Schnoor noted that numerous target indicators have been suggested by BOSC members. Dr. Schnoor asked, how do you show that ORD is making a difference (impact) with regard to: EPA (mission), environmental science (fund of knowledge), environmental agencies and Congress (using the science), and other nations (using the science). Some challenging questions raised by the BOSC members include:

- ✧ What are the major areas of unique strength in the EPA/ORD research program?
- ✧ Where and in what areas is world-class science being accomplished?
- ✧ Why are there so few members of the National Academies, Nobel Laureates, and the most distinguished scientists working in EPA/ORD?
- ✧ What would be needed to make EPA-ORD truly *the* environmental science agency, particularly with respect to ecology and the environment?

Dr. Chameides said that perhaps the last question should be “Why aren’t there more Nobel Laureates in environmental science? If there were more, ORD could work with them even if they are employed by other organizations.

Dr. Schnoor volunteered to draft a brief paper on performance measures and target indicators based on the responses provided by the BOSC members at the November meeting. He will circulate this straw document to the BOSC members for review and comment. He will finalize the document based on input from the members and submit the paper as a letter to the AA/ORD. Dr. Zimmerman expressed some concern that measures of success are context dependent. Dr. Mattison suggested engaging Dr. Gilman in a discussion of this issue because it relates to his vision of how planning should occur within ORD. Dr. Schnoor agreed that it would be beneficial to obtain Dr. Gilman’s input before drafting the letter. Dr. Bostrom suggested circulating a straw document prior to the May meeting, inviting Dr. Gilman to discuss the topic at that meeting, and then finalizing the letter report after receiving Dr. Gilman’s input. By March 15, Dr. Schnoor will circulate to the BOSC a straw document that is a synopsis of the performance measures responses provided by the BOSC members at the November meeting. At the May meeting, Dr. Gilman will be asked to describe his vision for measuring success at a research agency. Dr. Windom stated that the first step is to identify ORD’s customers and to determine what those customers are expecting from ORD. That forms the basis of measuring success. Dr. McCay pointed out that ORD’s ability to accomplish this reflects its level of planning.

Tuesday—February 12, 2002

Approval of the November Meeting and December Teleconference Minutes

Dr. Schnoor asked if there were any comments on the November 1-2, 2001, BOSC meeting minutes. Dr. Johnson asked that the action items of the minutes be revised as follows:

“Dr. Johnson agreed to provide a report prepared by a radioactive waste management committee on which he served to Dr. Preuss. This report discusses benchmarking and many of the same issues discussed by the BOSC.”

With this change, the minutes were approved unanimously by the BOSC Executive Committee. There were no comments on the December 17, 2001, teleconference minutes, and they were approved unanimously by the BOSC.

Multi-Year Plans

Dr. Preuss distributed a document (see Attachment 1) that reported the status of each MYP. He noted that seven MYPs have been completed (i.e., Air Toxics, Particulate Matter; Water Quality; Hazardous Waste, Contaminated Sites; Ecosystem Protection; Human Health; Mercury, Endocrine Disruptors, Socioeconomics; and Pollution Prevention). He explained that “completed” means the plans have been written and are in a stage of peer review. Dr. Preuss was not certain if all seven reports were available for distribution to the BOSC. He noted that several ORD senior executives (referred to as Executive Guidance Groups or EGGs) have been assigned to review each MYP, and three of the MYPs are undergoing this stage of review (i.e., Tropospheric Ozone, Safe Food, and Global Climate). Dr. Preuss pointed out that Goal 8, the core of the ORD research program, has a number of MYPs. Two MYPs (i.e., Drinking Water and Safe Communities) are in progress. The document distributed by Dr. Preuss also included a table that identified the lead author and the EGG for each MYP.

Dr. Bus asked if the MYPs are posted on the Web. Dr. Preuss replied that they are not posted on the Web; once peer review is completed, they will be made available on the ORD Web Site. Ms. Hamilton asked if there were executive summaries available for the MYPs. Dr. Preuss indicated that each MYP has a brief section up front that serves as an introduction and an executive summary. Dr. Schnoor asked that the complete MYPs for Water Quality and Pollution Prevention as well as the executive summaries of the other MYPs be distributed to the BOSC members as soon as possible. Dr. Preuss agreed to provide these items to the BOSC. Dr. Schnoor indicated that the BOSC would like to invite ORD staff to the next meeting to discuss these plans. Dr. Mattison noted that the MYPs are linked to specific goals in the EPA Strategic Plan. Dr. Preuss replied that there are 10 goals in the EPA Strategic Plan and ORD performs research to support 8 of those goals. A research strategy was prepared for each goal, and these MYPs are even more specific than those strategies. Dr. Mattison asked if those original strategies are posted on the Web, and Dr. Preuss replied that they were available on the Web. Dr. Zimmerman asked if the MYPs tie the EPA Strategic Plan, the ORD Strategic Plan, and the Laboratory/Center Strategic Plans together. Dr. Preuss commented that NCER has developed a number of brief papers that describe what the Center is doing and how it pertains to the MYPs.

Dr. Windom asked if the Program Offices assisted ORD in developing the goals articulated in its strategic plan. Dr. Preuss responded that ORD received input from the Program Offices through the Research Coordination Team (RCT), which includes individuals from ORD’s Laboratories/Centers and all relevant Program Offices and Regions. For example, in the area of air toxics, ORD meets annually with the Program Office to obtain input (from the Deputy AA) regarding priority research needs. The Council reviews these needs to ensure that there is balance in ORD’s overall plan. Dr. Preuss noted that the MYPs are written together with the Program Offices. Dr. Windom asked if the RCTs reviewed the research programs following implementation. Dr. Preuss indicated that the RCTs are involved in reviewing the programs.

Dr. Bostrom asked if the list of MYPs is complete. Are more plans needed? Dr. Preuss replied that the list is completed for the present. He anticipates that, over time, some of these plans will be phased out and others will be added. He stated that the MYPs are roadmaps to direct ORD’s programs and to be used to determine if ORD is on the right path. Dr. Schnoor noted the importance that the Laboratories/Centers have placed on the MYPs, and the reduced emphasis on the Laboratory/Center Strategic Plans. Dr. Preuss commented that this shift was understandable given the limited resources the Laboratories/Centers have to devote to strategic planning. Dr. Windom expressed some concern about the tendency to repackage and rename old programs. Dr. Preuss said that these MYPs are not a repackaging. That is one reason it has taken numerous drafts to develop each plan. These plans are

connected and logical, not just a conglomeration of the old projects. Dr. Windom asked if the MYPs preclude the continuation of research projects that are breaking new ground or for investigators to pursue exploratory research. Dr. Preuss replied that ORD's intramural program is the most important part of the research effort, and the STAR Program is the second most important component. ORD funding will enable the intramural program to conduct the research defined in the MYPs as well as some exploratory research without requesting additional resources. He noted that all of the Laboratories/Centers (with the exception of NCER) have significant funding per investigator to accomplish this research. Dr. Chameides asked if the plans take into account the efforts of other agencies. Dr. Preuss indicated that in devising the plans, ORD considers what other organizations are doing and identifies what it can do that would be beneficial.

NHEERL Subcommittee Report Discussion

Dr. Bus identified the individuals who attended the NHEERL site visit. He noted that the Laboratory was well prepared and prepared a good response to the self-study questions. NHEERL is a very large organization scattered at various locations across the United States; therefore, it was difficult to meet with a large number of staff at the site visit. However, Dr. Larry Reiter, Director of NHEERL, brought all of the Laboratory's Division leaders to the site visit.

Dr. Bus noted that NHEERL is implementing a fundamental cultural change, and there is clear evidence that NHEERL leadership has worked hard to implement that change. Although the Research Triangle Park, NC, laboratory is located in a new state-of-the-art facility, other facilities around the country need to be upgraded and updated. Dr. Bus commented that one of the Laboratory's major challenges is to bring together a large, diverse, and geographically dispersed organization.

Dr. Johnson suggested that all of the reports include a short biography on the Subcommittee members. Dr. Schnoor indicated that the preface will describe the review process and a list of the Subcommittee members and their affiliations. Dr. Bus noted that the NHEERL report is formatted similarly to the NERL report. Both Subcommittees clustered questions under high-level categories.

With regard to planning and integration, Dr. Bus stated that NHEERL has paralleled its strategic plan with the ORD Strategic Plan and the EPA Strategic Plan. Its planning efforts focus on two fundamental but related dimensions—organizational and scientific. During the site visit, Dr. Reiter shared with the Subcommittee a presentation that he has given at the NHEERL laboratories around the country. The Subcommittee commended this activity and found the presentation to be a useful communication tool, enabling all NHEERL staff to understand the fundamental mission of the Laboratory. The first recommendation encourages the NHEERL Director to aggressively continue efforts to build understanding of the importance of the NHEERL and ORD strategic plans across the Laboratory. The second recommendation is for NHEERL to develop Multi-Year Implementation Plans (MYIPs) for the remaining priority focus areas relevant to its mission. Another recommendation of the Subcommittee encourages NHEERL to develop a steering team for the Ecological Research/EMAP research focus (the only major area with no team in place). The Subcommittee also recommended that NHEERL develop criteria for determining when it is "time to quit" on any given research activity. Dr. Chameides did not think it was realistic to include this in the plans. He noted that new problems arise that force the Laboratory to shift its focus to new areas. Dr. Bus pointed out that investigators may wish to pursue new questions as they arise; however, that research may not be relevant to ORD's mission. He noted that "time to quit" criteria would help keep the research focused on Agency priorities. Dr. Windom mentioned the tendency for scientists to get entrenched in their research. He noted that NHEERL is trying to prevent this by rotating the leadership of the research teams. This approach has helped them phase out existing research, but the criteria would make it clearer. Dr. Schnoor indicated that this phase in/phase out issue should be addressed with regard to the MYPs, and he agreed to provide some wording to Dr. Bus for inclusion in the NHEERL report.

Dr. Bostrom pointed out that page 3 of the report erroneously refers to 14 MYPs instead of 16 MYPs. She noted that the report does not address how the MYPs relate to the NHEERL Strategic Plan. Dr. Mattison pointed out that several of the recommendations use the term “encourage to” in areas where the Subcommittee indicated NHEERL is doing a good job. Dr. Chameides agreed and pointed out that the wording “aggressively continue” infers that NHEERL is not doing much in that area. Also, the report refers to research plans that really solve problems. Dr. Bus agreed that this should be reworded to read “research plans focused on critical issues.” Several members thought the report should include more commendation and praise for what the Laboratory has done well. For example, NHEERL initiated the Assistant Laboratory Director (ALD) positions to improve Laboratory-wide integration. This concept was later adopted by other ORD Laboratories/Centers. Dr. Bus replied that the Subcommittee tried to incorporate that in the text, but he agreed to review it and reword as necessary.

With regard to integration, the Subcommittee recommended that NHEERL should develop tools for tracking the translation of Synergy Workgroup activities into research activities linked to the NHEERL Strategic Plan. Another recommendation encourages NHEERL to continue to seek opportunities and provide funding for exchanges of scientific expertise with other relevant EPA Laboratories and Centers. The Subcommittee also recommended that ORD and NHEERL investigate cost-sharing mechanisms that encourage scientific exchanges such as joint seminar programs within the Agency.

Dr. Bus noted that, over the past several years, NHEERL reorganizations have reduced the supervisor/employee ratio from 1:30 to 1:17. Since the last BOSC review, New Directors have been hired for all four research divisions as well as a Deputy Associate Director for Ecology to improve coordination across these divisions. In addition, NHEERL has been successful in elevating two division leadership roles to Senior Executive Service (SES) positions, which will significantly aid retention and potential future recruitment into these leadership roles. Dr. Bus also mentioned the Management Journal Club that has been established for current NHEERL leaders to improve management and leadership skills by identifying business literature describing best leadership and business practices. Dr. Johnson suggested adding a comment that this approach is effective in bringing about cultural change. Dr. Bostrom noted that the text is not clear with regard to how NHEERL is using these tools to implement their strategic plan. Dr. Bus agreed to add a paragraph describing how these tools are being used.

Under research implementation, the Subcommittee recommended that EPA executive leadership work with NHEERL leadership to seek legislative/administrative solutions that expand NHEERL/ORD options for recruiting and retaining a suitably flexible and talented scientific staff. Dr. Bus noted that the NIH allows for a limited tenure system that might be useful to ORD. Dr. Preuss commented that the BOSC may want to consider this as an overarching issue for ORD, not just NHEERL. Dr. Windom pointed out that there are a number of additional cross-cutting issues common to two or more reports. He suggested that the BOSC members review the reports to identify these cross-cutting issues. Dr. Schnoor asked each BOSC member to review the reports and develop a list of cross-cutting issues. Dr. Preuss noted that many of these cross-cutting recommendations should be directed to Dr. Gilman as advice on improving the management of ORD. In fact, some of the recommendations may go beyond ORD. Dr. Bus agreed to review the wording of the recommendations to make it clear whether it refers to EPA, ORD, or NHEERL.

The Subcommittee recommended that a specific strategy/process be developed for linking staff rotational assignments to the strategic scientific leadership needs of NHEERL. Dr. Bus commented that rotational assignments in Dow often lead to the individual leaving the original position; it is best for the company that employees find their best fit within the organization. Dr. Bus agreed to elaborate on this in the report. The Subcommittee also recommended that NHEERL carefully track and consider the implications of hiring post-doctoral fellows into permanent laboratory research positions. Such hires offer the advantages of more rapid integration into existing laboratory research; however, a potential disadvantage is that a disproportionate number of former post-doctoral fellows could diminish the diversity of the program. Also, it is not clear whether these post-doctoral fellows can compete in today’s environmental

arena outside the Agency. Dr. Bus noted that NHEERL has made efforts to increase gender and racial diversity in the sciences.

The goal of NHEERL's communication efforts is to translate its science into activities by EPA and those outside the Agency that have a beneficial impact on the environment. With regard to communications, the Subcommittee recommended that NHEERL consider developing a process for assessing customer satisfaction with its work products. The Laboratory needs processes and systems in place to ensure that its work products are translated in a meaningful way. Dr. Bostrom noted that this is a recurring theme at all ORD Laboratories/Centers. Dr. Schnoor asked if any of the Laboratories/Centers had developed and fielded survey instruments. Dr. Bostrom indicated that she had not gathered enough information from the Laboratories/Centers to respond to that question. Dr. Schnoor pointed out that if ORD had more social scientists on staff, there may be more impetus to develop surveys.

Concerning performance and measures of success, Dr. Bus stated that NHEERL has sought to identify and benchmark best practices such as strategic plan development and implementation, laboratory management, communication tools, flexible hiring practices, etc. The Subcommittee recommended that NHEERL continue to seek mechanisms for identifying and implementing a "best practices" approach to benchmarking. Dr. Zimmerman asked if NHEERL identified any organizations against which the Laboratory could benchmark. Dr. Windom replied that several organizations were identified; NHEERL selected different organizations for different activities. Dr. Schnoor supported NHEERL's best practices approach and suggested that it be included in the measures of success letter to the AA/ORD. Dr. Chameides expressed some concern that the focus of NHEERL's approach was inward when it should be beyond the Laboratory's mission. He suggested that NHEERL hold seminars to build a larger community of knowledge to ensure that problems are addressed by organizations outside EPA. Dr. Bus replied that NHEERL is holding workshops and seminars to accomplish this. Dr. Chameides commented that those seminars should be a measure of success.

Another recommendation of the Subcommittee is to develop a mechanism that quantitates/evaluates the scientific and regulatory impact (both use and value) of its scientific work products. Dr. Bostrom commented that there is no evidence of citation analysis within NHEERL. Dr. Bus stated that many NHEERL staff believe that they only need to publish their research. Few are concerned about how their science addresses the critical customer and Agency needs. Dr. Zimmerman asked about NHEERL's Web site. Dr. Bus replied that NHEERL has an excellent Web site.

Dr. Bus noted that NHEERL has instituted a peer review program of its divisions. Each of its nine divisions undergoes an external scientific peer review of the quality and scientific impact of its research every 3 to 4 years. The Subcommittee recommends that NHEERL continue this practice and implement a mechanism to evaluate and track how the peer review information is translated into refinements of Laboratory science and operations. Dr. Schnoor commented that the percentage of awards mentioned on page 9 of the report may be appropriate for NHEERL. He suggested that the Subcommittee examine those percentages relative to the percentage of ORD staff and resources residing within NHEERL. Dr. Bus agreed to reword that sentence appropriately. Dr. Bus pointed out that if the percentage of awards within NHEERL is low compared to ORD overall, it may indicate that NHEERL leadership is not paying enough attention to the scientists and promoting their work.

Dr. Schnoor suggested that the report identify NHEERL's key strengths (e.g., toxicology, the commitment of NHEERL leadership to bring about cultural change). Dr. Zimmerman asked if the site visit discussions included the number of individuals eligible for retirement. Dr. Bus replied that NHEERL is in the same position as the other ORD Laboratories/Centers with regard to retirement. He noted that NHEERL management is working to develop future leaders. Dr. Zimmerman asked if NHEERL's replacement strategy is driven by goals and if it is articulated in the Laboratory's strategic plan. Dr. Mattison asked if ORD is creating a platform to allow collaboration between its intramural scientists and those conducting epidemiological research under the extramural program. Dr. Schnoor

commented that the previous BOSC review recommended that NHEERL increase its epidemiological research. Dr. Bus replied that the Subcommittee did not dwell on that issue. He did not believe it was a problem. He assumed that the research teams would seek epidemiological expertise as needed. Dr. Schnoor stated that if it was not an issue during the site visit, it should not be addressed in the report. He asked that the BOSC members provide their comments on the NHEERL report to Dr. Bus as soon as possible.

Communications Subcommittee Progress Report

Dr. Bostrom reported that the Subcommittee members met in Seattle, WA, on December 2, to discuss how to approach the task of assisting ORD in improving communications of research results. The Subcommittee agreed to use the self-study question approach as one element of a three part strategy: (1) synthesize findings from and follow up on the communications questions asked of each Laboratory and Center by the BOSC review teams, (2) follow up on the NCERQA Communications Strategy reviewed in 1998 by the BOSC, and (3) analysis of the self-study communications cases. The Subcommittee decided to focus the self study on communication innovations in ORD. The Subcommittee also agreed that the BOSC should send the questions directly to the appropriate Laboratory/Center topic directors, with copies to appropriate parties such as the Office of Communications. Dr. Bostrom circulated a copy of a draft letter, a list of self-study questions, and a list of questions regarding the NCERQA Communications Strategy and Implementation Plan prepared by the Subcommittee. She noted that until the Subcommittee has reviewed the responses to the self-study questions that were submitted in response to the Laboratory/Center reviews, it cannot make a final selection of communication innovation cases. Dr. Bostrom indicated that she would like Dr. Preuss to assist the Subcommittee in identifying the individuals who should receive the self-study questions. Dr. Bostrom mentioned that she would like to distribute the questions within the next few weeks.

To obtain input from the BOSC with regard to the case studies, Dr. Bostrom prepared the following list of potential case study topics:

NCER

- ✧ Research “capsules”
- ✧ State-of-the-science reports
- ✧ STAR workshops

NCEA

- ✧ IRIS
- ✧ NCEA Web Site

NHEERL

- ✧ Science report (is it public yet?)
- ✧ Synergy workgroup
- ✧ Seminar series with OPPTS

NERL

- ✧ EIMS (ORD-wide but initiated by NERL)
- ✧ Research abstracts

NRMRL

- ✧ SITE, ETV
- ✧ CERl
- ✧ Capstone reports
- ✧ RME (Risk Management Evaluation)

- ✧ SAGE, CAGE, AAGE, PARIS II (decision support)
- ✧ Pollution prevention tools workshop

Cross-Cutting

- ✧ Particulate matter (is there a PM accomplishments report?)

Dr. Johnson commented that there are a number of audiences and instruments identified in the Laboratory/Center Subcommittee reports. Which instrument is appropriate for a specific audience?

Dr. Bostrom indicated that the Subcommittee intends to review the responses to the communication questions posed during the Laboratory/Center reviews. She noted that there does not appear to be a systematic identification of audiences, and the ability of the Laboratories/Centers to communicate with those audiences varies considerably. The Subcommittee intends to examine overarching communication issues within ORD. Dr. Bostrom indicated that she plans to distribute the questions to the appropriate ORD staff and then follow up the distribution with a telephone call to discuss the questions and to clarify them as needed. She asked Dr. Preuss to review the questions and provide his comments to her as soon as possible. She also requested the BOSC members to provide comments on which case studies the Subcommittee should undertake. She asked if the Subcommittee should include a cross-cutting case study. Dr. Mattison commented that it might be interesting to select a highly visible cross-cutting issue, such as endocrine disruptors, and examine how it has been managed across the Laboratories/Centers. Dr. Bostrom indicated that the Subcommittee would like to focus on PM. Dr. Mattison stated that PM and endocrine disruptors are interesting for different reasons. It was agreed that either topic would be appropriate for the Subcommittee. Dr. Preuss commented that EMAP may be the best cross-cutting program to examine. Dr. Windom agreed because EMAP involves interaction with local governments as well as the states. Dr. Schnoor pointed out that the Subcommittee will not have the time to examine all of these case studies. Dr. Bus said he was unaware of the NHEERL science report. He indicated that NHEERL has an annual accomplishments report, but did not recall a science report. Dr. Bostrom stated that the NHEERL science report will be available on the Web in the fall of 2002. Dr. Bus suggested that the Synergy Workgroup may be a better case study for the Subcommittee. When Dr. Bostrom stated that the Subcommittee planned to skip NERL, Dr. McCay suggested that the Subcommittee examine the EIMS. She also noted that NERL's Web Site offers users the opportunity to try out various models. This could be an interesting case study for the Subcommittee. Dr. Bostrom said the Subcommittee intends to include a broad range of audiences in these case studies. She mentioned that the major audience for NCEA's Web Site is the public; the primary audience for NCER's STAR workshops is intramural and extramural researchers with the goal of integrating these two major research programs. Dr. Johnson suggested narrowing down the list of case studies by creating a matrix of products and target audiences. Dr. Bostrom did not endorse this approach because ORD often has not identified the target audience for these products. Dr. Zimmerman suggested focusing the case studies on a single audience and examining how all five Laboratories/Centers communicate with that audience.

Dr. Schnoor suggested that the Subcommittee proceed with distributing the self-study questions. He asked that the BOSC members submit recommendations to Dr. Bostrom with regard to what products the Subcommittee should examine. Dr. Bostrom asked if it was reasonable to request the responses to the self-study questions within 2 months from their distribution. Dr. Preuss replied that the next 2 months are very busy because ORD is immersed in the FY 2004 budgeting process. He thought 2 months may be adequate if he could work with Dr. Bostrom to reduce the number of questions. She indicated that the Subcommittee would like to receive the self-study responses by April and to schedule a site visit to NCER before the next BOSC meeting. Ms. Hamilton reminded Dr. Bostrom that she needs some lead time to schedule the site visit and to announce it in the *Federal Register*. Dr. Preuss thought it would be difficult to complete the self-study question responses by April. Dr. Schnoor suggested that Dr. Bostrom revise the schedule for completion of the review. Dr. Bostrom agreed and suggested that the NCER site visit be scheduled in May. Given this delay, a draft of the Communications Subcommittee report will not be available until the September meeting.

FY 2003 ORD Budget

Dr. Preuss informed the BOSC that there were a number of significant changes in the FY 2003 ORD budget. One of the major changes is the elimination of funding for the fellowship program. It has been zeroed out for FY 2003. He noted that this is part of the shift of funds to NSF. Another major change is the \$10 million funding for the National Environmental Technology Challenge (NETC). ORD has the lead for this new initiative to conduct a national competition designed to promote and recognize new technology or new application of existing technology.

Dr. Schnoor mentioned that the Office of Management and Budget reviewed a number of reports, including the BOSC reports, when determining funding changes. Therefore, the BOSC's recommendations must be clear and precise.

NERL Subcommittee Report Discussion

Dr. McCay indicated that the list of recommendations on the first page would be moved to the end of the report when it is revised. She identified the Subcommittee members who participated in the NERL site visit. Like NHEERL, NERL has laboratories in various locations around the country (i.e., Research Triangle Park, NC; Athens, GA; Las Vegas, NV; and Cincinnati, OH). Principal Investigators (PIs) and managers from all of the geographical locations, as well as the Branch Chiefs and Division Directors attended the site visit.

In February 2001, NERL completed an extensive workforce planning effort to improve its organizational structure and culture so that the Laboratory could contribute to ORD's vision to conduct leading edge research and foster the sound use of science and technology to protect human health and the environment. Since the last BOSC review, NERL has developed a strategic plan that invited the BOSC to review it. The BOSC did not review the plan at that time, and NERL postponed completing the plan to better coordinate with ORD's strategic planning process. NERL is updating its strategic plan and will submit it for external review in 2002. Dr. McCay noted that extensive planning has been carried out by NERL in relation to the ORD Strategic Plan 2000, because the NERL research priorities overlap extensively with the ORD priorities, which are related to the EPA's 10 goals. She noted that these relationships were demonstrated in a table provided in the self-study question responses. Dr. McCay asked if the reports should include items, such as this table, from the self-study responses. Dr. Schnoor said that if it was a good summary for the Subcommittee it probably would benefit the readers of the Subcommittee report.

Dr. McCay noted that planning takes place primarily through the multi-year Program Research Overviews and the annual "business plans," all within GPRA's framework of EPA Annual Performance Goals and Annual Performance Measures. With regard to planning and integration, the Subcommittee recommended that NERL continue its commitment to strategic planning and consider, within that effort, developing contingency planning and budgeting to accommodate extraordinary events, such as the September 11, 2001, tragedy and its aftermath, which included the use of NERL expertise.

Dr. Bus noted that NERL's approach differs considerably from NHEERL's approach. He suggested that the Laboratories/Centers need a common set of implementation approaches and best practices. Dr. McCay commented that NERL uses the LOGIC model to link tasks to short-, intermediate-, and long-term outputs on a task-by-task basis. The Subcommittee was impressed with this approach. Dr. McCay noted that NERL has invested in a major effort to make the Laboratory a "high performing organization" (HPO) using the Pickering process. Accountability is central to this process, and efforts are being made to improve relationships with clients. The Subcommittee urged NERL to develop a more specific process for the participation of PIs in the formulation of the HPO integration strategy and other strategic planning.

Dr. Bostrom asked that the report include a reference for the Pickering process. Ms. Hamilton stated that this process was presented to ORD staff with regard to the ORD Strategic Plan. Each Laboratory/Center

was free to determine which method it would take to become an HPO. She commented that each Laboratory/Center has engaged a consultant to assist in the process of becoming an HPO. Dr. Johnson was surprised that none of the other Laboratories/Centers had mentioned this fact during the site visits. Ms. Hamilton suggested that the Subcommittee may want to question NERL management about why the Pickering process was selected. Dr. Bus stated that if ORD wants to become an HPO, it needs to implement the same best practices across the Laboratories/Centers. Ms. Hamilton informed the BOSC that there is a network of HPOs that showcases best practices. The Office of Resources Management and Administration (ORMA), collects and shares information about best practices in the Laboratories and Centers.

Dr. Schnoor commented that NERL's vision statement should be reworded. The Laboratory does not mean to say decisions should be based on real exposures, rather NERL means to say that its vision is to reduce the scientific uncertainties of exposure on which decisions are made.

Dr. Bostrom noted that the budgeting process is being synchronized with the MYPs for the first time. She requested that Dr. Preuss discuss this issue at the next meeting during the discussion of MYPs. Dr. Zimmerman supported Dr. Bostrom's request. She noted that the budget helps to explain the Laboratory's actions. Dr. McCay stated the NERL could be commended for its strategic planning efforts. Dr. Bus said that the report inferred that there was some tension in planning at the leadership level and how that is communicated to those in the ranks.

To some extent, NERL managers have shifted from the risk paradigm to a paradigm that emphasizes customer service as a result of the Laboratory's recent adoption of the HPO approach. The Subcommittee applauded NERL's client-driven focus, but urged NERL to ensure that a portion of the research effort be devoted to innovative, exploratory research that may not have immediate or direct applicability to client needs. Dr. McCay agreed to add to the report that the MYPs are a mechanism for integration within ORD. With regard to integration within NERL, the Laboratory relies heavily on the ALDs. Dr. Schnoor thought it would be helpful for the report to include a list of the Laboratory/Center divisions. It was agreed that each report would include an organization chart for the Laboratory/Center. Concerning integration with the Regional Offices, NERL is rather insulated from the Regions. The Subcommittee did not have any recommendations with regard to regional integration because the existing mechanisms appear to be adequate.

The Subcommittee encouraged NERL to continue its self-assessment to identify specific ways scientists can work together across division and branch boundaries and remain responsive to client needs. With regard to incorporation of social and behavioral research, the Subcommittee recommended that NERL include non-economic social scientists as recruitment targets. Dr. McCay noted that there are projects within NERL that need input from social scientists, but they do not have adequate in-house expertise. Dr. Schnoor pointed out that Dr. McCay's statement should be added to the report. Dr. Bostrom commented that the NERL self-study question responses included only one sentence about human activities. Dr. Schnoor suggested that the Subcommittee report identify some instances where input of social scientists could improve the program. Dr. McCay agreed that the Subcommittee, which includes considerable social science expertise, could assist NERL in this area. Dr. McCay noted that NERL's FTEs are nearly balanced between human health and ecology. Dr. Schnoor asked if NERL is top heavy with regard to administration. Dr. McCay replied that the Laboratory is top heavy, but there has been a decline in individuals whose jobs are limited to administration. However, there also has been a disturbing decline in technical support staff.

In the section on strengths and challenges, the Subcommittee recommended that NERL restore funding for exploratory research. It also recommended that NERL conduct a self-evaluation to determine its ability to be flexible in responding to restructuring its science areas/work units or to developing specialty ad hoc work units in response to client needs. To foster collaboration and integration, the Subcommittee

recommended that NERL involve the PIs in formulation of the integration process. Dr. McCay indicated that NERL should be commended for its responsiveness to customers.

Another recommendation of the Subcommittee is to remove federal post-doctoral researchers from the FTE ceiling. This will improve flexibility in responding to impending requirements. The Subcommittee also recommended that NERL management consider ways of communicating more clearly with scientific staff that the benefits of its “matrix” organizational structure offset the perceived disadvantages of additional resources absorbed by bureaucracy and confusing lines of accountability. Dr. McCay noted that the PIs expressed some concern about the layers of management. For example, the PIs have to market their ideas to their direct managers as well as the ALDs to obtain final approval. Dr. McCay pointed out that there is clearly a communication challenge with regard to structure. Dr. Bus commented that it may be a planning challenge. The PIs are viewing themselves as independent. They need to understand how their science fits into the overall program.

Dr. McCay indicated that the Subcommittee was convinced that the ALDs is the best method for integration within NERL. She did not agree that the hierarchy was as layered as some staff implied. Dr. Bostrom cautioned the BOSC from recommending that the PIs be persuaded that the structure is appropriate. Instead, she suggested that NERL develop better ways of communicating with the PIs that will meet their needs. Dr. McCay noted that the site visit included only a very small sample of PIs. Therefore, the Subcommittee was hesitant to state that NERL is not communicating the advantages of the matrix structure effectively.

With regard to communication, the PIs thought they communicated well with the Branch Chiefs, but they did not believe they communicated with management beyond that level. Dr. Schnoor noted that the report did not mention the role of the ALDs in communicating results within ORD. Dr. McCay agreed to add that to the report. Dr. Bostrom commented that the report does not address communication of research results. Dr. McCay replied that the Subcommittee was relying on Dr. Karen Chess, who participated on the site visit, to provide that input, and she has prepared several paragraphs for inclusion in the report. Dr. Bostrom expressed some concern about the study cited in the paragraphs prepared by Dr. Chess. What was the purpose of the study? By providing feedback during the study, they changed the behavior of the study subjects. That is not good research. Dr. Schnoor pointed out that this can be attributed to lack of appropriate social science expertise at the Laboratory. Dr. Bostrom stressed the need for sensitivity to different types of social science research. Dr. McCay agreed to expand on the need for social scientists; she asked Dr. Bostrom to review it, and she agreed. Dr. McCay said that NERL employs one individual whose job is to communicate research results.

Dr. McCay noted that the NERL workforce has decreased steadily over the past 5 years, and a disconcerting portion of the scientific staff is eligible for retirement in the next few years. Clearly, NERL faces significant workforce development and recruitment challenges. Dr. McCay mentioned that NERL is having difficulty retaining its best post-doctoral fellows, even when offering substantial starting salaries. She indicated that there is a list of retention factors in the report, and noted that NERL offers a number of opportunities for retraining and further training of staff. NERL relies on contractor support as a means of working around the FTE limitations imposed by OMB. The major concern with using contractors is that it places limits on direct communication with the technical staff and adds to overhead costs for contract administration. Ethnic diversity at NERL is very low. The Subcommittee members were informed that NERL management has plans to address this issue, but none were articulated during the site visit. She noted that the Cincinnati and Athens facilities have been working on diversity. The Subcommittee recommended that NERL continue outreach for a more diverse workforce and take advantage of the turnover to increase the diversity of its workforce. Dr. Schnoor asked Dr. McCay to emphasize the problem with minority recruitment in the report, and she agreed.

With regard to benchmarking, NERL will be using best practices. Dr. McCay stated that the Subcommittee members did not have much input on this issue. Dr. Schnoor suggested adding a sentence

or two about NHEERL's plans for benchmarking. Dr. Bus asked if this reflects another staff and management disconnect. Do the staff believe that publishing is adequate, while the managers are stressing the need to take the products to venues that will increase their use? Dr. McCay stated that NERL staff are confused about this issue. A number said that they were unaware of this new emphasis. Dr. Bus agreed to provide some comments to Dr. McCay concerning this issue.

Dr. Bostrom noted that NERL's approach is in stark contrast to NCEA's approach. NERL is trying to get into the trenches to do the analysis, and in so doing, they have lost sight of what it means to be a leader. Dr. McCay said that NERL's approach may be consistent with the Pickering process. Dr. Schnoor pointed out that NERL should be the leader in a number of areas (e.g., personal dosimetry, modeling, pharmacokinetics, indoor air, emissions databases). Dr. Mattison noted that the Centers for Disease Control and Prevention (CDC) is beginning to publish body burdens; he is concerned that NERL is getting outdistanced. Dr. Windom expressed some concern that the divisions view themselves as independent laboratories, rather than working as part of the NERL team. Dr. Schnoor asked the BOSC members to submit their comments on the NERL report to Dr. McCay as soon as possible. He noted that this report is not as complete as some of the others. A revised draft will be discussed during the March conference call, and the final vote will probably occur at the next meeting. He emphasized the need for the revised draft to be distributed to the BOSC members prior to the conference call. Dr. McCay agreed to distribute the revised report prior to the call. Dr. McCay asked if the report should be sent to the NERL Director, and Ms. Hamilton replied that she had already sent it. Ms. Hamilton asked that the reports sent to Ms. Campbell for distribution include a date because numerous drafts of several reports have already been circulated. Ms. Campbell agreed to format and circulate the revised reports to the BOSC members prior to the March conference call. Ms. Hamilton asked that the Chairs send any self-study materials that are to be included in the report to Ms. Campbell.

BOSC Charter Renewal

Dr. Schnoor indicated that the BOSC charter will expire in approximately 3 weeks. He noted that Dr. Gilman would like the BOSC to become more involved in scientific review rather than be limited to management review. Dr. Preuss agreed to provide his comments on how to revise the charter to Ms. Campbell for distribution to the BOSC. He asked that the BOSC members e-mail any changes to him or Ms. Hamilton as soon as possible.

Dr. Bostrom asked if the charter should include language concerning standing subcommittees. Dr. Windom said the new charter should indicate that the BOSC will be more focused on the science than in the past. He suggested adding "research plans and products" following "National Laboratories and Centers" under 3d of the charter. Dr. Schnoor thought the BOSC should ask Dr. Gilman if he believes that the \$234,450 cited in item 7 of the charter is adequate to cover the work that he would like the BOSC to undertake. Dr. Schnoor noted that item 8 did not specifically mention teleconferences, but Ms. Hamilton did not think that needed to be added. Dr. Schnoor pointed out that the BOSC will meet five times this year if the teleconference is counted as a meeting. He asked if the charter should indicate that the BOSC will have one standing subcommittee for each Laboratory/Center in ORD. Ms. Hamilton said she would like to consult EPA management to determine if the Agency will approve five additional committees before adding this language to the charter. Dr. Schnoor pointed out that these subcommittees would not be Federal Advisory Committee Act (FACA) committees. They would report to the BOSC. It was agreed that the subcommittees would not have the right to provide advice separate from the BOSC. Dr. Bostrom did not think the language of the existing charter precluded the creation of standing subcommittees. Dr. Zimmerman noted that the recommendations in the Laboratory/Center review reports should be from the BOSC and not the Subcommittees. Dr. Schnoor agreed and asked each Chair to ensure that this is true for his/her report. Several members agreed with Dr. Bostrom that the language in the charter did not have to be altered to allow the creation of standing subcommittees. Dr. Schnoor asked how the current Laboratory/Center Subcommittees could be converted to standing Subcommittees. Ms. Hamilton agreed to verify that there is no need to change the charter to allow formation of standing

subcommittees. Ms. Hamilton asked the BOSC members to send to her any additional comments on the charter as soon as possible.

The remainder of the meeting discussion was devoted to identifying common themes among the various Laboratory/Center review reports. Dr. Schnoor noted that benchmarking (at what level), personnel pyramid, and contingency planning were common to several reports. Other common themes include: strategy for increasing pay, communications assessment, how to interpret the ORD Strategic Plan with the Laboratory/Center plans, mechanisms for becoming an HPO, marketing (identifying clients and surveying them), tracking the activities of the Laboratories/Centers, and flexibility in hiring. Dr. Schnoor asked that the BOSC members identify additional common themes as they review the revised reports.

Dr. Bostrom moved to adjourn the meeting, and Dr. Bus seconded the motion. Dr. Schnoor adjourned the meeting at 2:24 p.m.

Action Items

The following action items were identified during the meeting discussions:

- ✧ The Subcommittee Chairs will ensure that their respective reports include the updated list of MYPs provided by Dr. Preuss. An asterisk will be placed by those reports for which the Laboratory/Center is the lead or to which it contributes.
- ✧ Dr. Schnoor and Dr. Chameides agreed to do the final vetting of the NCEA report. Ms. Campbell agreed to assist with final formatting of this report as well as the remaining reports to ensure a more consistent format.
- ✧ Ms. Hamilton agreed to circulate the Pollution Prevention and Water Quality MYPs and the Executive Summaries of the other MYPs (those that are available) to the BOSC members prior to the next meeting.
- ✧ Dr. Schnoor agreed to distribute to the BOSC members a statement of the goals for the MYP review to be conducted at the next meeting.
- ✧ Ms. Campbell agreed to circulate the list generated by Dr. Small's Nominations Subcommittee to the BOSC members to assist with developing a list of nominees for the spring 2002. The BOSC members will submit any additional names (with resumes) to Dr. Schnoor before the May meeting.
- ✧ Ms. Hamilton agreed to determine if the AA/ORD will be available for the May 13-14, 2002, and September 23-24, 2002, meetings.
- ✧ Dr. Schnoor volunteered to draft a brief paper on performance measures and target indicators based on the responses provided by the BOSC members at the November meeting. He will circulate this straw document to the BOSC members for review and comment by March 15. Then, he will finalize the document based on input from the members and submit the paper as a letter to the AA/ORD.
- ✧ Dr. Schnoor agreed to provide some wording to Dr. Bus for inclusion in the NHEERL report regarding the phase in/phase out of the MYPs.
- ✧ Dr. Bus agreed to incorporate more commendation and praise for what NHEERL has done well into the report. For example, NHEERL initiated the Assistant Laboratory Director (ALD) positions to improve Laboratory-wide integration, and this concept was later adopted by other ORD Laboratories/Centers because of its effectiveness.
- ✧ Dr. Bus agreed to add a paragraph to the NHEERL report that describes how the Laboratory is using the various tools (e.g., the Management Journal Club) described in the report.
- ✧ Each BOSC member will review the reports and add to the list of cross-cutting issues identified at the close of the meeting. All additions should be sent to Dr. Schnoor prior to the next meeting.
- ✧ Because some of the cross-cutting recommendations should be directed to Dr. Gilman as advice on improving the management of ORD, and others to EPA, Dr. Bus agreed to review the wording of the recommendations in the NHEERL report to make it clear whether it refers to EPA, ORD, or NHEERL.

- ✧ Dr. Bus agreed to elaborate on the benefits of rotational assignments in the NHEERL report (i.e., how rotational assignments often lead to the individual leaving the original position for one that is a better fit, which benefits the organization).
- ✧ Dr. Bus agreed to reword the sentence on page 9 of the NHEERL report that refers to the percentage of awards because these percentages may be appropriate for NHEERL, given its percentage of the ORD budget and staffing.
- ✧ Dr. Preuss agreed to review the questions developed by the Communications Subcommittee and provide his comments to Dr. Bostrom as soon as possible. The BOSC members will provide to Dr. Bostrom comments on which case studies the Communications Subcommittee should undertake.
- ✧ Dr. Bostrom requested that Dr. Preuss discuss the synchronization of the budgeting process and the MYPs at the next meeting.
- ✧ Dr. McCay agreed to add to the NERL report that the MYPs are a mechanism for integration within ORD.
- ✧ The Subcommittee Chairs will ensure that their reports include an organization chart for the respective Laboratory/Center that identifies its divisions.
- ✧ Dr. McCay agreed to add to the NERL report her statement regarding projects within NERL that need input from social scientists, but the Laboratory lacks adequate in-house expertise.
- ✧ Dr. McCay agreed to add to the NERL report some instances where input of social scientists could improve the program.
- ✧ Dr. McCay agreed to mention the role of the ALDs in communicating results within ORD in the NERL report.
- ✧ Dr. McCay agreed to emphasize the problem with minority recruitment in the NERL report.
- ✧ Dr. McCay agreed to add several sentences to the NERL report on NHEERL's plans for benchmarking. Dr. Bus agreed to provide some comments to Dr. McCay concerning this issue.
- ✧ The BOSC members will submit comments on the NERL report to Dr. McCay as soon as possible.
- ✧ Dr. McCay agreed to send the revised NERL report to Ms. Campbell so that it can be distributed to the BOSC members prior to the March 26 conference call.
- ✧ The Subcommittee Chairs will send the revised reports to Ms. Campbell at SCG. The Chairs should include the date on the reports so that they can be distinguished from previous drafts. Ms. Campbell will format and circulate the revised reports to the BOSC members prior to the March conference call. The Chairs also should send any self-study materials that are to be included in the report to Ms. Campbell prior to the March conference call.
- ✧ Dr. Preuss agreed to provide his comments on how to revise the BOSC charter to Ms. Campbell for distribution to the BOSC. The BOSC members should e-mail any changes to the charter to him or Ms. Hamilton as soon as possible.
- ✧ Ms. Hamilton agreed to verify that there is no need to change the BOSC charter to allow formation of standing subcommittees.

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**ATTACHMENT 1:
Multi-Year Plan Status**

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