

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

**BOARD OF SCIENTIFIC COUNSELORS
EXECUTIVE COMMITTEE MEETING**

**Washington, DC
October 16-17, 2000**

Monday—October 16, 2000

Introduction and Overview of the Meeting

Dr. Jerry Schnoor (University of Iowa), Chair of the Board of Scientific Counselors (BOSC), called the meeting to order at 9:25 a.m. He thanked everyone for coming and asked them to introduce themselves for the benefit of the new BOSC members.

Greetings and Remarks

Dr. Norine Noonan (Assistant Administrator for the Office of Research and Development) welcomed the new and returning BOSC members and explained that the BOSC is an advisory committee for the Office of Research and Development (ORD). She noted that the BOSC Chair sits on EPA's Science Advisory Board (SAB). Dr. Noonan indicated that she has a list of items that she would like the BOSC to consider for the future. ORD is interested in expanding the community of experts with whom ORD interacts. She noted that this expansion is part of ORD's strategic plan. Dr. Noonan mentioned that all government agencies are required to prepare a strategic plan under the Government Performance and Results Act (GPRA). The plans should cover a 3-5 year time period and should be revised as needed. Agencies are required to do annual performance plans, which contain goals and measures of effectiveness, and 1 year following the plan, a performance report is prepared. She commented that EPA's first performance report was submitted to Congress in March 2000. EPA currently is working on performance plans to accompany the 2002 budget and the performance report for 2000 that will be submitted to Congress in March 2001.

Dr. Noonan said that EPA has institutionalized GPRA more than other agencies. EPA has established 10 goals (with objectives and subobjectives), and for the past 4 years, the entire Agency's budget has been arranged by these goals. Resources are associated with the goals and objectives that the Agency intends to accomplish. Dr. Noonan indicated that this approach places a challenge on the Agency to identify metrics for performance and to collect the data required to support these metrics. She emphasized the difficulty of this task.

According to Dr. Noonan, EPA's strategic plan has implications for ORD, which serves as the central research and development (R&D) laboratory for the Agency. She pointed out that ORD's role is two-fold: (1) ORD conducts research to support the activities of the Program Offices and Regions, and (2) ORD conducts core R&D activities to ensure the competitiveness or effectiveness of ORD in the long term. Dr. Noonan noted that these latter activities are those that underpin much of the Agency's efforts.

She mentioned that risk assessment is a good example of ORD's efforts to support Agency-wide activities. Dr. Noonan explained that core research is research that is broadly applicable. She pointed out that ORD no longer uses the terms "basic" and "applied" with regard to its research efforts. She said that ORD is operating a line organization in a matrix world. Dr. Noonan reported that ORD developed a strategic plan, which actually preceded the Agency's strategic plan. ORD's efforts are concentrated on eight goals—Goals 1 through 7 are problem driven and Goal 8 is core research. The first ORD plan was founded almost completely on science priorities. The most recent plan is a mature plan that focuses on science as well as how the goals and objectives will be achieved. Dr. Noonan said that there is more work to be done on the plan, and she intends to seek input from the BOSC and SAB regarding the plan. She hopes that the plan will be finalized by the end of December. This strategic plan evolved from ORD input as well as input from external and internal stakeholders solicited at workshops. Dr. Noonan commented that the plan already has been through extensive review within EPA and will soon be ready for the BOSC and the SAB. She noted that this will be discussed in more detail during tomorrow's session.

Dr. Noonan identified a number of other items the BOSC may want to consider, including:

- ✧ Review one or more of ORD's multiyear plans. ORD initiated this multiyear planning approach with five areas—particulate matter, endocrine disruptors, global change, Environmental Monitoring and Assessment Program (EMAP), and drinking water. Dr. Noonan would like input on the balance between problem-driven and core research in ORD's research portfolio. Will the planned research allow the Agency to accomplish the GPRA goals/objectives? She pointed out that these plans will enable ORD to identify the positive and negative effects of resource changes, making it easy for Congress to assess the ramifications of budget changes.
- ✧ Identify new approaches for recruiting scientists to ORD. Dr. Noonan pointed out that the age profile of ORD is 10 years older than the profile for the entire Agency. She also noted that more than one-third of ORD's personnel will be eligible to retire in the next 3-5 years. ORD needs to recruit the right skills mix to take advantage of new opportunities. For example, the National Risk Management Research Laboratory (NRMRL) recently hired two urban planners to assist with research on ecological restoration of urban areas. Dr. Noonan mentioned that the Agency has an aggressive post-doctoral program. The goal is to hire 150 post-docs in the laboratories for 3-year positions. She commented that the federal government is a good employer for post-docs because the salaries are higher and the benefits are better. In addition, EPA's new state-of-the-art facility in Research Triangle Park, NC, is an excellent place for post-docs to continue their training and build their reputations.
- ✧ Assist ORD in improving communication within the Agency and with external organizations. Dr. Noonan mentioned that more responsibilities for environmental protection are being delegated to the Regions and states. Therefore, ORD needs better communication with the Regions and states. In addition, ORD needs to improve communication with the academic community, regulated community, environmental justice community, tribes, and others.
- ✧ Identify appropriate metrics for ORD that are representative of the impact of the research. Are ORD's products providing a sound scientific basis for Agency decisions? How can performance measurements be improved? Dr. Noonan said that ORD must move beyond "citation counting."

Dr. Jim Clark (Exxon Mobil Research & Engineering Company) asked if the question regarding whether or not EPA should have a research program still remains. Dr. Noonan responded that she hopes it is no longer an issue. The National Research Council (NRC) Committee concluded that every regulatory agency needs internal R&D capability to ensure the infusion of new scientific thinking into the decision-making process. She cited the split of the Occupational Safety and Health Administration (OSHA) and

the National Institute for Occupational Safety and Health (NIOSH) as an example of the destructive separation of R&D and regulation. Dr. Noonan commented that, in the past, ORD has not spent much time thinking about how the science can be used by the Agency. Although ORD cannot force EPA decision makers to use the science, ORD can ensure that robust, high quality science is available to these decision makers.

Dr. Herbert Windom (Skidaway Institute of Oceanography) asked how the “turf battle” is handled between EPA and the National Oceanographic and Atmospheric Administration (NOAA). Dr. Noonan responded that EPA works very well with NOAA on numerous programs including the Coastal Initiative, for which NOAA is a chief partner. Dr. Rae Zimmerman (New York University) asked if there had been any consistent efforts to examine the Coastal Initiative with respect to GPRA metrics. Dr. Noonan replied that no such effort had been made. She added that the Agency is struggling with identifying appropriate metrics, particularly because of the need to measure what is important not just what can be measured. She commented that ORD’s next big challenge is to develop meaningful metrics for the STAR Program. Dr. Peter Preuss (Director of the National Center for Environmental Research, ORD) indicated that this topic has been discussed with the National Academy of Sciences (NAS). On two previous occasions, ORD has requested that NAS assist in the development of metrics for the STAR Program and the board has refused. The board members were concerned that if the STAR Program did not achieve the metrics, then this good program could suffer. The new board at NAS has agreed to develop specific metrics for each topic area within the Program (e.g., water and watersheds).

Dr. Ann Bostrom (Georgia Institute of Technology) mentioned the role of the Committee on Environment and Natural Resources (CENR) of the National Science and Technology Council in facilitating interagency communication and collaboration. Dr. Bostrom said that, in her opinion, CENR has not done as much as it could to improve communication and collaboration of environmental research across the federal government. Dr. Noonan replied that EPA would like the CENR to be more proactive in promoting an environmental research agenda for the Nation, not just the federal government. Dr. Windom agreed that this is a real problem. It must be demonstrated that environmental research saves jobs and money. Dr. Noonan replied that ORD is a leader in environmental economics, which is an important topic area. How do people value a stream behind their house or open space? What are people willing to do to prevent urban sprawl?

Dr. Jim Bus (Dow Chemical Company) pointed out that the metrics of an environmental research organization would measure behavioral changes. He noted that companies must change behavior or they go out of business. The government is different, but the metrics still should involve behavior changes. He said that it is important to reward changes in behavior. Dr. Noonan responded that the government is not as agile as the private sector, but she agreed the Agency needs to promote incentives for behavior changes. She noted that this administration has instituted many new initiatives that represent a departure from “business as usual,” including EPA’s Brownfields Program, which recently was awarded Harvard’s Innovations in Government Award. Dr. Noonan stated that bringing about such change in the Agency takes time and consistent leadership, which is not always possible. Dr. Schnoor asked the BOSC members to think about the items Dr. Noonan described so that the Board can begin to chart a course for assisting ORD over the next few years.

Swearing In of New Members

The new BOSC members present at the meeting—Drs. Jim Clark, Elaine Dorward-King (Rio Tinto Borax), Juarine Stewart (Clark Atlanta University), and Herbert Windom—were sworn in by Ms. Jessie Hopkins (EPA Personnel Specialist). Drs. Noonan, Schnoor, and Preuss congratulated the new members and welcomed them to the BOSC.

Following a brief break, Dr. Schnoor quickly reviewed the agenda. He asked the BOSC members to review the minutes of the May meeting during the evening so that a vote for approval could be taken before the meeting is adjourned. He noted that one of the goals of the meeting is to complete the review of the Particulate Matter (PM) Research Program report. He asked the new Board members to review the report and be ready to provide their comments during the discussion. Dr. Schnoor pointed out that he had completed a draft of the Integration Subcommittee chapter and the executive summary, working from the notes of the Integration Subcommittee. He stated that the names of the new BOSC members will be listed in the report, but it will be noted that these members were not involved in the entire review. Dr. Zimmerman is the only BOSC member who has submitted comments on the report. He asked the BOSC members to focus their comments on substantive issues, rather than minor formatting issues. Dr. Schnoor indicated that tomorrow's session will include discussion of BOSC priorities. Board members also will be asked to comment on the ORD Strategic Plan 2000 during tomorrow's session.

Dr. Preuss noted that three of the seven new BOSC members were unable to attend this meeting, but he expects that they will be at the next meeting. For the benefit of the new members, Dr. Preuss explained that as one of the five Center/Laboratory Directors in ORD, the BOSC's decisions directly affect him. However, he also serves as the BOSC Liaison because he worked diligently for years to establish the BOSC and believes that ORD will benefit substantially from its input.

Open Discussion

Dr. Marilyn Brown (Oak Ridge National Laboratory) said that the BOSC has not addressed the human resource aspects of ORD's operation. She mentioned that the former BOSC Chair, Dr. Costel Denson, wanted the BOSC to address the issues of ORD's aging workforce, skills mismatch, skills realignment, communications, and continuing education opportunities. She noted that, since the reorganization in 1995, there has been a shift from managing contractors conducting the research to actually conducting the research. Dr. Zimmerman mentioned that one example of the skills mismatch is the lack of epidemiologists within EPA. Dr. Windom mentioned that post-tenure review is a hot issue in academia. Is there something similar at EPA? How are senior scientists reviewed? Dr. Preuss replied that the Center/Laboratory Directors are evaluated on how well they are implementing the research plans developed by ORD. Individual scientists are evaluated annually, but this review is not exactly the same as a tenure review; it is not on the same level. He stated that advisory committees often are asked to review policy for staff reviews. Dr. Schnoor commented that the BOSC has not yet served in that role. Dr. Mitch Small (Carnegie-Mellon University) thinks post-tenure reviews are beneficial; they ensure that professional development is part of one's long-range plan. Dr. Dorward-King asked if the human resource issues were at the top levels or the staff levels. Dr. Brown replied that there are different issues at different levels. She added that in conducting the Laboratory/Center reviews, the BOSC members talked with bench-level scientists who expressed some concerns about opportunities to progress in their careers, travel funds, sabbaticals, etc. Dr. Bus suggested that it may be valuable to obtain feedback from the Laboratories/Centers with regard to whether the advice provided in the reports was helpful.

Dr. Bostrom brought up the communications plan. She noted that the BOSC did not have an opportunity to review the plan during the STAR Program review, and she suggested that the BOSC review that plan. Dr. Schnoor asked if the members think the BOSC should do periodic or ongoing reviews of the Laboratories/Centers. Perhaps the BOSC could review communications and other issues as part of the Laboratory/Center followup. Dr. Bostrom suggested that a separate committee may be needed to review communications. Dr. Bus said that the BOSC should look at how its input has been translated within the Laboratories/Centers. Has the advice been used? Is it bringing value to ORD? Dr. Preuss commented that the BOSC has been very helpful to ORD and there have been numerous requests regarding additional BOSC assistance. He suggested that the BOSC members review these requests and determine how the Board can be most useful. Dr. Preuss also mentioned that ORD has attempted to prepare a human

resources plan; if the BOSC would like to be involved in this issue, the Board should work with Dr. Hal Zenick, who is heading up the effort to prepare that plan.

Dr. Windom asked if ORD is having any problems recruiting post-docs. He suggested reviewing the approach implemented by the National Research Council (NRC) to identify ways to enhance the post-doc program. Dr. Preuss responded that there has been a tremendous response to EPA fellowships and post-doc positions. EPA can only award 1 of every 10 applications; therefore, the pool of applicants is quite large. He commented that the Agency views post-docs as serving many purposes, only one of which is a supply for new hires. Dr. Windom mentioned that he has participated on review panels for STAR fellowships and he agreed that the Agency is receiving many good applications. He asked if those being funded are representative of the types of skills the Agency will need in the future. Are individuals with appropriate skills being recruited and what is their success rate if hired? Dr. Schnoor asked the BOSC members if they viewed this human resources issue as a unique effort. Should it be part of the Laboratory/Center followup? Dr. Brown suggested that it should be part of the followup with the Laboratories/Centers. She noted that human resources planning is a major objective in the BOSC charter. Dr. Schnoor indicated that there is a need for ongoing review of the Laboratories/Centers. He said that communications and human resources could be emphasized in the initial followup. Should the BOSC create standing committees for this purpose? Dr. Stewart asked if the Laboratory/Center Directors acknowledge the need for such review by the BOSC. Dr. Schnoor responded that the Directors have indicated their preference for a permanent body (i.e., standing subcommittees) that could provide them external advice as needed. Dr. Preuss said that all of the Laboratory/Center Directors are in favor of this idea; he noted that there are many areas within ORD that have received little external review.

Dr. Schnoor agreed to provide Dr. Noonan's notes on future efforts to the BOSC members. He identified a number of the issues:

- ✧ TMDLs—there has been little peer review of this issue.
- ✧ Role of ORD in a mission Agency—identification of metrics that will demonstrate whether or not ORD is doing its job.
- ✧ Genetically modified organisms.
- ✧ Children's asthma.
- ✧ Endocrine disruptors multiyear plan (needs to be reviewed).
- ✧ Reformulated fuels.
- ✧ Risk paradigm—a post-audit analysis is needed. Should ORD continue to be organized around the paradigm?
- ✧ Contaminant lists.
- ✧ Drinking water multiyear plan (needs to be reviewed).

In response to a question regarding the status of the multiyear plans, Dr. Preuss indicated that, based on the success of the pilot plans, ORD is preparing these plans for every research area in the portfolio. He noted that there are no external reviews scheduled for those plans; therefore, BOSC input would be very helpful. Dr. Preuss suggested that the BOSC could review the entire set (total of 20 plans) to examine integration and how they match with the budget; or the BOSC could select one or two of the plans for review.

BOSC Operating Procedures

Dr. Schnoor asked if a Vice Chair should be appointed to serve as back-up for the Chair. He mentioned that the number of meetings for the Chair has grown substantially and he may not be available for all of the meetings. For example, he is unable to attend the November 1, 2000, SAB meeting. Dr. Brown agreed that it might be helpful to have a Vice Chair and suggested that one of the newer members be appointed for continuity after the Chair departs. Dr. Schnoor said he will serve as Chair for the next 2 years. Dr. Bostrom agreed with the concept of a Vice Chair, but pointed out that no one seems to have the time to serve in that capacity. Dr. Zimmerman asked if members could rotate into the Vice Chair position. Dr. Small asked if the current BOSC Designated Federal Officer (DFO) could be replaced with a technical staff person who could represent the BOSC at some of these other meetings. Dr. Bostrom pointed out that if the DFO represents the BOSC, the Board will not appear to maintain its independence. Ms. Shirley Hamilton (National Center for Environmental Research, ORD) responded that the DFO is prohibited from representing an advisory committee. Dr. Windom noted that the issue of independence is important, but the Board members have to be knowledgeable about the organization to provide useful advice. He suggested that the Vice Chair could be the Chair elect; he noted that this helps maintain continuity in the Board. Dr. Preuss commented that the Board may want to consider brief rotations for Vice Chair; he mentioned that the Chair is appointed by the Assistant Administrator, so it may be difficult for the Vice Chair to be the Chair elect.

Dr. Schnoor mentioned that the BOSC can only be effective if it maintains its independence, and the Board has been successful in preserving its independence thus far. He asked if the Assistant Administrator should appoint a Vice Chair who would serve as the Chair elect. Dr. Small replied that the Board should start by identifying an individual willing to serve as Vice Chair. He volunteered to attend some meetings, but he was not available to attend them all. Dr. Clark pointed out that the Vice Chair will have to be up to date on numerous issues; therefore, a more permanent Vice Chair may be more appropriate. Dr. Schnoor commented that someone in the Washington, DC, area may be a good candidate because many of the meetings are in that area. Most of the BOSC members agreed that they would be willing to go to an occasional meeting when Dr. Schnoor was unable to attend. Dr. Bus agreed that this approach would work as long as the individual could teleconference with Dr. Schnoor before the meeting to review the important issues. Dr. Schnoor asked the Board members to let him know if they were available to represent the BOSC at the November 1, 2000, SAB meeting.

Ethics Update

Mr. Hale Hawbecker (EPA's Office of General Counsel) provided a brief presentation on ethics. He noted that these ethics rules are imposed because the BOSC members are serving as special government employees. He indicated that the most important issue is the financial disclosure report. This form must be submitted annually; the short form 450A can be submitted if there are no changes from the previous year. Mr. Hawbecker noted that this form is one of the means used by the Agency to detect conflict of interest issues.

Mr. Hawbecker mentioned the criminal conflict of interest statutes—18 U.S.C. §203, which prohibits compensated representation activities by federal employees directed toward the United States, and 18 U.S.C. §205, which prohibits uncompensated or gratuitous representational activities by federal employees directed toward the United States. He noted that if a Board member participates in a matter involving specific parties—specific grants, contracts, permits, licenses, litigation, etc.—then that member is prohibited from having anything to do with that party for any branch of the government. Mr. Hawbecker noted that these prohibitions do not apply if the Board members are only providing general policy advice.

Mr. Hawbecker pointed out that there are some post-employment restrictions. He also noted the conflict of interest rule. No Board member can participate in any matter that will have a direct effect on his/her financial interest, or those of his/her spouse, minor child, employee, or any organization with which he/she is negotiating for or with. He said that the Board members may work on matters that affect their employers. There is a government-wide exemption that allows parties to participate in matters that affect their employers if the matters involve general applicability. He mentioned that an individual can hold up to \$5,000 of a particular stock and work on a specific matter; an individual can hold up to \$25,000 stock and work on a general matter. Dr. Clark asked if sitting on a STAR peer review panel would be considered a conflict of interest. Mr. Hawbecker replied that it would not be a conflict. He noted that these restrictions only apply to his service as a federal employee (i.e., BOSC activities).

Mr. Hawbecker reported that there are a number of other ethics related statutes that apply to BOSC members. He indicated that Board members can continue to receive fees for teaching, speaking, and writing when these activities are performed as a non-government employee. He mentioned that there is a related test; if an activity is closely related to the BOSC role, then compensation cannot be accepted. In addition, if the subject matter involves specific parties with whom the member worked on the BOSC, the member could not receive compensation. With regard to gifts, the general rule is that a government employee can accept gifts worth \$20 or less, especially from those who have matters pending before the BOSC.

Mr. Hawbecker indicated that BOSC members can engage in fundraising activities as long as the members do not solicit funds from persons known to them who would be affected by the BOSC. In determining whether a BOSC member could participate in matters that affect his/her cousin, brother-in-law, or someone living with him/her, the member must use the test of impartiality. If there is any question about impartiality, Mr. Hawbecker encouraged the BOSC members to consult the DFO before participating in the activity. He pointed out that it is better to ask the ethics official before participating. He noted that there is a Constitutional limitation on employment of special government employees by foreign governments. Mr. Hawbecker noted that this includes foreign universities. He mentioned that the Hatch Act applies to special government employees; BOSC members should not campaign or wear campaign paraphernalia while conducting BOSC activities. BOSC members are prohibited from receiving, soliciting, or accepting campaign funds and they are prohibited from using their title as a BOSC member in any capacity for political reasons. In closing, Mr. Hawbecker noted that Ethics Advisory 97-15 contains everything a BOSC member needs to know about ethics. He asked members to contact him at 202-564-5546, if they have any questions.

Ms. Hamilton mentioned that Ethics Advisory 97-15 clearly delineates the differences between regular and special government employees. She noted that Board members can co-mingle their frequent flyer miles on one card, but those miles accrued for BOSC travel should be used only for BOSC related travel. If a Board member gets bumped from a flight while on BOSC travel and receives a free ticket, the member can use the ticket for personal travel. Ms. Hamilton mentioned that Dr. Preuss is an EPA ethics official and she encouraged the Board members to contact him if they have any questions. Dr. Zimmerman asked if a Board member would be allowed to participate in a research project on PM. Mr. Hawbecker replied that the only concern would be in releasing confidential information obtained while conducting the BOSC review. He indicated that receiving compensation on issues related to PM, other than his/her teaching salary may be questionable.

Dr. Preuss commented that many ethics issues involve judgement calls. He noted that last year a grant was rejected for conflict of interest; the grantee appealed the decision and the grant was awarded. Ms. Hamilton mentioned that ethics training is a yearly requirement for BOSC members.

Discussion of the Report on the PM Research Program Review

Dr. Schnoor indicated that Chapters 2-7 were discussed at prior BOSC meetings; however, the Executive Summary and Chapter 1 are new to this draft and have not been discussed previously. Dr. Bus asked if the Integration Subcommittee members had reviewed these two sections. Dr. Schnoor replied that the Subcommittee members have not reviewed these sections. He asked the BOSC members to confine their comments to substantive issues. Are the tone and level of detail appropriate? He suggested that members submit any suggested editorial changes in writing following the meeting. Dr. Schnoor said that he will work with Dr. Preuss and Ms. Beverly Campbell (SCG) to incorporate any changes and to finalize the report. Dr. Schnoor mentioned that he had received comments from Drs. Zimmerman and Brown. He noted that Dr. Brown had asked what is meant by line authority. Dr. Schnoor replied that line authority means that the Program Director should have staff and a budget. The BOSC agreed that the Program Manager should have authority over sufficient resources and should be granted some budget flexibility allowing movement of funds within the program to facilitate response to gaps and opportunities. Dr. Preuss pointed out that Dr. Vandenberg has broad authority to persuade the Laboratory/Center Directors to shift resources. He noted that about 2-5 percent of the budget is held back to allow for some flexibility. Dr. Schnoor suggested that the term “line authority” be removed from the report.

Dr. Schnoor pointed out that the Integration Subcommittee expressed some concern about overall integration. The disconnect between national ambient air quality standards (NAAQS) and PM has not been fleshed out. This review is being done because of the proposed NAAQS. Are there controls to achieve these standards? If these standards are achieved, will it improve human health? Dr. Preuss noted that the wording in the report can be confusing; there are places in the report where it should refer to the Office of Air and Radiation (OAR), not the entire Agency. Dr. Bostrom replied that the body of the report refers to OAR not EPA; the Executive Summary should be revised appropriately. She also suggested that the reference to gap and sensitivity analysis be clarified. She pointed out that gap analysis is “fuzzy”; information analysis is more specific.

Dr. Schnoor brought up metrics (mentioned on page iv, the third bold line), and noted that the BOSC has not spent much time discussing this topic. Dr. Windom asked if it is customary to use the term “pollutant” when the proper term would be “contaminant.” He noted that natural dust would be included as a pollutant if such is the case. Dr. Schnoor responded that pollutant is commonly used by ORD and it includes natural contaminants.

Dr. Small pointed out that the next to last paragraph in the Executive Summary is not related to PM. He asked if another sentence or two should be added to clarify that specific areas of metrics for PM are considered in terms of impact on scientific literature, regulatory programs, etc. Dr. Schnoor asked Dr. Small to prepare those sentences. Dr. Bus suggested adding a reference to research relevance. Is ORD doing the right science and is the science right? Dr. Small agreed to add words regarding productivity and relevance to impact. Dr. Schnoor indicated that he will change the tone of the Executive Summary and Chapter 1 to better convey the message that the BOSC members agreed that the PM Program is a good program. Dr. Bostrom commented that the report does not indicate in strong terms that the PM structure is exemplary. Dr. Bus noted that the opening sentences in Chapter 1 indicate that the program is well organized and efficient. Dr. Schnoor suggested that he borrow some sentences like those to change the tone of the Executive Summary. Dr. Clark proposed that the report indicate that the BOSC’s suggestions are designed to make a good program even better. Dr. Bostrom suggested that the third to the last paragraph in the Executive Summary be moved to the beginning. With these changes, the BOSC members agreed that the Executive Summary would adequately reflect the results of the review.

Dr. Schnoor indicated that he drafted the first four pages of Chapter 1 based on the notes of the Integration Subcommittee and the integration bullets prepared by the other subcommittees. Dr. Zimmerman asked if there is a better way to organize the overall integration section. Should we use subheadings? She suggested adding a sentence or two indicating that these are issues that cut across

more than one area. Dr. Schnoor agreed that such a statement should be added. He also volunteered to organize the section under subheadings.

Dr. Small suggested that the list of journals with regard to metrics and evaluation (second bold item on page 4) should be changed to ensure that it is representative of various PM areas. Dr. Bus proposed that the first bold item on page 3 in overall integration should be changed to emphasize the PM Program as a model program; the suggestions are intended to further enhance the program. Dr. Schnoor agreed to make that change, to remove the term “line authority,” and to better explain the issue of budget authority and flexibility. Dr. Schnoor asked if there were any comments about the third item: “recognizes cooperation and encourages it to continue.” Dr. Zimmerman agreed with the statement, but suggested adding: “as a model for cooperation between ORD and Program Offices.”

Dr. Schnoor indicated that the fourth bold sentence was taken directly from Dr. Denson’s Subcommittee notes. Dr. Bostrom suggested that this item be clarified by adding something like: “take leadership for expanding and coordinating integration and coordination of research.” Dr. Bus noted that it could serve as a model for other groups. Dr. Schnoor asked if the words “not just ORD” should be removed. Dr. Bostrom suggested combining the two paragraphs and reverse the order. Dr. Schnoor agreed to make the change and to insert the heading: Integrated Agency Leadership.

The fifth bold sentence refers to the need to integrate PM research with other air quality issues. Dr. Small suggested adding: “has significant interactions with PM in terms of sources and formation.” Dr. Schnoor indicated that PM research is at a plateau—some areas should decline while others rise; eventually, the entire PM portfolio should change. The question is: Are the changes planned? Dr. Schnoor agreed to revise this sentence to indicate that the BOSC is referring to a balance in the overall research portfolio. Dr. Small suggested adding to that sentence: “ozone, and hazardous air pollutants (HAPs). He also proposed adding “public health, environmental, and cost significance” to the fifth bold item.

Dr. Schnoor asked for comments on the first bold item on page 4 of Chapter 1. He said the Integration Subcommittee indicated the need for gap analysis as well as GPRA and trial risk analyses. The Subcommittee also suggested that the GPRA format be used for the multiyear plans. Dr. Preuss replied that the GPRA format is being used. Dr. Schnoor asked if PM related to a GPRA goal and Dr. Preuss affirmed that there is a related goal. Dr. Schnoor asked if these goals are numerical and specific. Dr. Preuss replied that EPA’s higher goals are numerical, but they get less specific at the next level down. Dr. Bostrom suggested that the first bold item be reworded as follows: “The BOSC commends use of the GPRA format in multiyear planning and other planning efforts. The BOSC also encourages the incorporation of gap analysis in multiyear planning.

With regard to the second bold item on page 4, Dr. Bus suggested that the wording be revised to indicate that stakeholder involvement is required to develop metrics, because the metrics must be understood and appreciated by those who will benefit. Dr. Schnoor asked: Who are the stakeholders? Dr. Preuss replied that they include industry, government, and the public. The terms “customer” and “client” and used interchangeably in the report. Dr. Bus questioned whether the BOSC wanted to state that ORD is in the best position to develop metrics. Dr. Bostrom suggested that the second half of the sentence (after the word “impact”) be deleted. Dr. Small proposed rewording the item to indicate that EPA/ORD should develop metrics in consultation with other stakeholders.

With regard to productivity, Dr. Bus cautioned that there may be too much focus on journals and not enough on impact. Dr. Small suggested that the paragraph he prepares to address this issue in the Executive Summary be used for Chapter 1 as well. Dr. Schnoor noted that the most important issue is whether the research is being conducted to protect human health. There was some question concerning

the meaning of the third bold item on page 4, which refers to gap analysis. Dr. Bostrom suggested that the members of the Integration Subcommittee be asked to clarify this item.

Dr. Preuss commented that the fifth bold item on page 4 could be misread. He said that EPA cannot go to Congress in the same manner as the National Institutes of Health because EPA is not an independently funded agency; there are many restrictions on ORD for approaching Congress. Dr. Preuss suggested rewording the item to focus on improving communication with Congressional staff. Dr. Bus noted that other Subcommittees indicated that there was good communication between ORD and the scientific community. Should the BOSC encourage EPA to explore more fully opportunities to communicate with the public and Congress? Dr. Schnoor suggested that the last sentence of the paragraph be moved forward because it provides some explanation.

Dr. Schnoor asked the members if they were ready to vote on acceptance of the report. Because a number of BOSC members were not present at the meeting, he suggested that a vote could be taken by telephone or e-mail after the report is revised and distributed once more for final review. The members agreed to postpone the vote until after the report was revised and distributed to all the members for review. Ms. Hamilton reminded Dr. Schnoor that if a conference call to discuss the report is scheduled, a notice must be placed in the *Federal Register*. He asked if Drs. Denson, Loehr, and Henry (the members of the Integration Subcommittee) could be involved in that call, and Ms. Hamilton replied that they could participate in the call if they so choose. After polling the members for availability, Dr. Schnoor indicated that the conference call should be scheduled for November 16 after 10:30 a.m. EST. He agreed to send the revised report to the members of the Integration Subcommittee and invite them to participate in the call. Tentative dates for the next BOSC meeting were identified and members were asked to keep the following dates open: January 22-23, January 29-30, and February 5-6.

Dr. Preuss mentioned that a cover letter from Dr. Schnoor to Dr. Noonan is needed to transmit the report. He suggested that the involvement of the new members with the report could be described in the letter. Dr. Schnoor asked if there were any comments on other sections of the PM report. Dr. Small noted the phrase: "Perhaps ORD could proceed..." on page 6, line 7. He suggested deleting the word "perhaps." Dr. Preuss asked about the proposed introductory program for post-docs. Would that be good for them? Dr. Bostrom explained that, through this introductory program, post-docs would spend 1 week in each Laboratory/Center to learn about the organization's focus and activities. Dr. Schnoor pointed out that rotation usually refers to a period of 6 months to 1 year. Dr. Bostrom commented that the purpose of this suggestion is to provide cross-training. She suggested that it be revised so that rotations are offered to those post-docs who would prefer to spend 1 year in each of three Laboratories/Centers. Dr. Small agreed that having a select few serve longer rotations in other Laboratories/Centers may improve integration. Dr. Schnoor pointed out that ORD is relying heavily on post-docs, primarily because ORD does not have much flexibility for other appointments for young scientists. Dr. Preuss commented that there is no problem with appointing permanent young scientists. The Laboratories/Centers can hire when they choose and there has been an adequate pool of young applicants from which new hires are selected.

Dr. Schnoor said that the report notes that the Agency lacks epidemiology expertise, but EPA is taking steps to alleviate this problem. He commented that the report does not mention that the indoor air program no longer exists; however, the BOSC has been assured that indoor air research has been continued under other programs. He mentioned that exposure is not being addressed adequately and Dr. Henry noted that weakness. Dr. Schnoor suggested adding exposure to epidemiology on page 8 of the report. Dr. Preuss asked the BOSC to clarify what is meant when the report states that something is lacking. Is it lacking in the intramural program or the overall program? Dr. Bostrom replied that the area needs to be strengthened. Dr. Preuss asked if the report states that there is inadequate epidemiological research. Is the extramural research being considered by the BOSC? Dr. Small asked if the report reflects the new PM centers.

Dr. Bostrom noted that there are no bold statements in the epidemiology chapter. One recommendation in that chapter should be for EPA to develop epidemiological expertise. The intramural epidemiological expertise is lacking. Dr. Preuss pointed out that the same applies to exposure; ORD sponsors considerable extramural exposure research. Is there a compelling reason for ORD to have intramural exposure expertise? Dr. Stewart suggested that the BOSC examine both the intramural and extramural research programs before stating that something is lacking. Dr. Bostrom responded that there must be a balance between intramural and extramural research. Dr. Bus agreed that some internal expertise in epidemiology and exposure is needed for interpretation, application, analysis, and integration of the research. Dr. Clark proposed that the cover letter indicate that these recommendations were compiled about 1 year ago and some things have changed since then. Dr. Windom said that the balance may be skewed for epidemiology and exposure; the BOSC could recommend that ORD maintain some core expertise in these areas. Dr. Schnoor agreed to revise the report as suggested. He asked about indoor air exposures, noting that outdoor air influences indoor air more than previously thought. This is mentioned in Chapter 2; Dr. Schnoor agreed to consult the Integration Subcommittee regarding whether this issue should be mentioned in Chapter 1. Dr. Schnoor indicated that he would have several changes to be incorporated into Chapter 4 by tomorrow.

Dr. Bus noted an important issue—ORD must have the ability to evaluate STAR investigators to ensure that technology and information are transferred into the PM Program. Dr. Schnoor asked Dr. Bus to prepare several sentences on this issue for incorporation into Chapter 1, and he adjourned the meeting for the day.

Tuesday—October 17, 2000

Dr. Schnoor called the meeting to order at 9:14 a.m. He introduced Dr. Tim Oppelt (Director of NRMRL) and Dr. Don Barnes (SAB Staff Director). He indicated that BOSC priorities was the first topic of discussion.

BOSC Priorities

Dr. Preuss distributed a handout (see Attachment 1) that contained nine suggested topics for future BOSC activities. He noted that the list was not meant to be inclusive; it is just a list of ideas for the BOSC to consider. Dr. Preuss quickly reviewed each of the nine areas.

Laboratory Science Management and Operations—Should the BOSC followup on the original Laboratory/Center reviews to assess how well the recommendations have been implemented? Should the BOSC establish standing subcommittees, perhaps two or three members per Laboratory/Center, to formalize the mechanism to review Laboratory/Center issues and provide advice? Dr. Preuss mentioned that Dr. Larry Reiter would like to have regularly scheduled reviews for each of his Laboratory Divisions. Such reviews have been conducted on an *ad hoc* basis for the past few years, and Dr. Reiter would prefer a more formal mechanism. All of the Laboratory/Center Directors agree that there is a need for ongoing advice and reviews.

Multiyear Plans—The first draft of the multiyear plans should be completed within the next 4-6 weeks. The drafts will be subjected to an extensive peer review within ORD; the Laboratory/Center Directors and Science Council will devote 1 week to reviewing the plans. Dr. Preuss noted that each plan requires an external review. He suggested that the BOSC could review the format, which is a large matrix with the goals (to be achieved in the next 10 years) at the top of each column. The rows identify what each Laboratory/Center intends to produce; these items should enable ORD to meet the goal listed at the top. The BOSC also could do a gap analysis using this matrix. Approximately 15 pages of text will accompany the matrix; the text will describe the logic of the goals and what is to be accomplished. Dr.

Preuss mentioned that ORD started with six pilot multiyear plans; those are the plans that will be completed first.

Dr. Windom asked about the number of plans and whether they relate to ORD's strategic goals. Dr. Preuss replied that there will be approximately 20 multiyear plans depending on how they are counted; he noted that the human health plan actually has four plans under it, as does the ecology multiyear plan. He said there are eight areas in the ORD Strategic Plan 2000 and there will be a multiyear plan for each area; the additional 12 plans cover the remainder of ORD's portfolio. Dr. Preuss mentioned that no budget information is contained in the multiyear plans; the writers of the plans have been directed to assume a flat budget throughout the 10 year period. He noted that the focus, at this stage, is content rather than budget. It is more important to determine where ORD needs to go first. Dr. Preuss indicated that the six pilot multiyear plans are for drinking water, endocrine disruptors, PM, global climate change, EMAP, and pollution prevention. He mentioned that EMAP has been incorporated into the larger ecological plan, but the other five plans stand alone.

Dr. Schnoor suggested that the BOSC select one or two of the pilot multiyear plans for review; he noted that Dr. Noonan would like all of the plans to be reviewed. Dr. Zimmerman commented that not all of the plans are integrated (e.g., drinking water) and asked what was meant by reviewing integration. Dr. Preuss responded that the BOSC should assess whether the work is integrated among the Laboratories/Centers and integrated within the area for those plans that do not cross areas. He mentioned that, for drinking water, there is substantial effort included in the human health plan. The PM plan is furthest along and the BOSC is very familiar with this program, so the BOSC could start with that plan.

Workforce Planning—ORD has begun to look at workforce planning. The BOSC could serve as a consultative body as each Laboratory/Center develops its own workforce plan. The BOSC also could review these plans.

Review of the Research Strategies/Plans—ORD has been preparing research strategies and plans for the past several years. Dr. Preuss explained that strategies are broader, and plans are more detailed. Many of these documents have been reviewed by the SAB or other external groups; therefore, they do not require content review. Dr. Preuss suggested that the BOSC could look at integration and overall focus within and across the plans.

Portfolio Turnover—What is the best method to facilitate appropriate portfolio turnover? Is ORD turning over its research portfolio to ensure that projects end at the appropriate time, and that new efforts are started in a timely manner? Dr. Barnes asked how current turnover decisions are made. Dr. Preuss replied that these decisions currently are made through the planning process, which involves several hundred people from ORD, the Program Offices, and the Regions. This group decides what research needs to be conducted and what resources are needed (approximately) to implement it.

Communication—This is an important area for ORD. As a mission Agency, ORD must ensure that other organizations are able to use its research. Dr. Preuss noted that there is a gap in translating what ORD research means and how it can be used by others. He mentioned that ORD is attempting to address this problem with the state-of-the-science documents. Are there other techniques that ORD could adopt to address this issue? He commented that the STAR Program does many of the suggestions that have been mentioned thus far and yet more needs to be done. ORD needs assistance in determining what more should be done. He pointed out that, for PM, there is a mechanism for ORD and OAR to interact, but in other areas such a mechanism is lacking. Dr. Preuss acknowledged that there is a lot of room for improvement in this area.

Effectiveness—To what degree are research products used by EPA, the states, and others? Are ORD products providing the basis for Agency decisions? Dr. Preuss commented that this topic as well as the next topic concern metrics.

Measure the Quality of Science—ORD has identified a number of potential metrics and discussion of these ideas with the BOSC could be beneficial. Dr. Preuss noted that it is important to develop some metrics now so ORD can begin to collect data to measure progress.

NAS Review of STAR Program—NAS has agreed to conduct a series of evaluations of specific parts of the STAR Program and, for each part, NAS will try to develop a set of metrics. Dr. Preuss mentioned that the BOSC was involved in the previous review of STAR. The BOSC could wait and review the NAS report, or the BOSC could be actively involved in the NAS review. He indicated that one BOSC member could serve on the NAS panel conducting the review.

Dr. Oppelt indicated that it is important that the BOSC's role be different from the SAB's role. He would like to the BOSC to help in ways that the SAB cannot. He suggested that there are a number of items on the list that could be combined. For example, workforce planning and portfolio turnover are part of laboratory science management and operations. He noted that review of the multiyear plans may help the BOSC assess how well research is integrated across ORD. Dr. Oppelt said that the SAB has indicated, on many occasions, that ORD does a poor job of telling people what it does. He noted that there are 50 separate Web sites within ORD; they do not have a common format and some of them do not even mention ORD. He said that if the BOSC addressed only one of these nine topics, it would be beneficial to the Laboratories/Centers. The self-study was good for NRMRL; it helped the staff focus attention on important issues.

Dr. Schnoor thanked Drs. Preuss and Oppelt for their input and expressed his desire to outline a plan forward for the BOSC before the end of today's meeting. He asked the BOSC members their opinions about the first item on the list—laboratory science management and operations. Dr. Windom recognized the usefulness of such an effort. Dr. Schnoor asked whether the BOSC should establish standing subcommittees and Dr. Bus commented that he did not want the standing committees to detract from the other things that Dr. Noonan would like the BOSC to do. Dr. Windom noted that a number of items on the list are cross-cutting; the BOSC could look at items 1, 3, and 6 simultaneously. Much of what the BOSC needs to examine with regard to these items is at the Laboratory/Center level. Dr. Bostrom mentioned that establishing standing subcommittees would ensure organizational memory. Dr. Zimmerman asked if there are areas that the Laboratories/Centers would like the standing subcommittees to address. Dr. Preuss replied that there are numerous areas and some are consistent across the Laboratories/Center (e.g., strategic plans, workforce plans); however, other areas are specific to a particular Laboratory/Center (e.g., Dr. Reiter's requested review of his Laboratory's nine Divisions).

Dr. Brown suggested that there be three BOSC members and two additional people on each subcommittee. Each subcommittee will tackle issues topic by topic. The first step may be a followup on the original Laboratory/Center review. There were no strategic plans at the time of that review, so the subcommittees could review those. The next steps could be review of the workforce planning documents, review of portfolio turnover, and then review of communications. Dr. Clark pointed out that many of these issues are interconnected; he suggested taking an area (e.g., PM, drinking water) and following it through so that the BOSC could get a vision for how that research area is implemented throughout ORD. Dr. Bus agreed that it may be better to take a multiyear plan and examine staffing, budget, etc. He suggested that division reviews should be conducted differently than they have been in the past. Dr. Bostrom pointed out that looking at only one plan obscures integration planning.

Dr. Schnoor said that three alternative approaches have been suggested: (1) the BOSC focuses on one goal (one multiyear plan), (2) the BOSC looks at the Laboratories/Centers, or (3) the BOSC reviews

numerous items on the list through the standing subcommittees. The BOSC members agreed to establish five standing subcommittees (one for each Laboratory/Center) and to look at strategic plans, workforce planning, and communication within each Laboratory/Center. Dr. Schnoor would like the subcommittees to examine the role of ORD as a mission agency. Dr. Bostrom suggested that the BOSC explore communications independent of the subcommittees. This separate subcommittee could use the information on communications gathered from the Laboratories/Centers by the standing subcommittees. Dr. Windom expressed interest in communication between ORD and the Regions. He believes that is the best way to communicate with the states. Drs. Windom and Bostrom agreed that this issue might not come up if everything is reviewed through the Laboratories/Centers. Dr. Oppelt indicated that the multiyear plans may not address workforce planning and communication; these plans are designed for use by ORD to outline future research activities and their time sequence. Dr. Preuss said that these plans also will be used as tools outside of ORD to explain the research program and what happens if the budget changes.

Dr. Brown suggested that the BOSC complete these activities in phases. In Phase I, the standing subcommittees would assess how the Laboratories/Centers have responded to the previous reviews; in Phase II, the BOSC could examine the strategic plans; in Phase III, the BOSC could consult on workforce planning; and in Phase IV, the BOSC could review one of the multiyear plans. Drs. Preuss and Oppelt indicated that it may be several months before the first multiyear plan is completed and ready for review. Dr. Oppelt said that a draft of the workforce plan should be completed within 6 months. To assess communications, data must be collected. Dr. Schnoor noted that the BOSC would have to develop a list of questions specific to communications. Dr. Bus indicated that review of the multiyear plan will involve metrics. He noted that the metrics should measure whether the organization is migrating toward what it needs to become; there is a need for behavioral change metrics. Dr. Bostrom suggested that the standing subcommittees look at behavioral change metrics.

Dr. Schnoor pointed out that if there are five standing subcommittees (two members on each subcommittee), there are five remaining BOSC members who could tackle a cross-cutting issue such as communications. Dr. Windom suggested that the entire BOSC review two of the multiyear plans. Perhaps the BOSC should look at one plan before the others are completed; this approach would allow the BOSC to provide input that could be used to improve the subsequent plans. Dr. Bus agreed and noted that the BOSC should look at the plans to determine if ORD is including all of the components necessary for a good multiyear plan. It should be a process review, which would be applicable across all plans. Dr. Schnoor said that the BOSC should look at more than one multiyear plan and the BOSC members agreed. He asked the members for input on which plans to review. Dr. Bostrom suggested that the BOSC members review all of the draft plans that are available and then make a decision on which two to select for review. Ms. Hamilton agreed to send the draft plans for PM, drinking water, endocrine disruptors, global climate change, and pollution prevention to the BOSC members. Dr. Preuss said that he expected to receive the drafts in November, so the copies will not be sent to the BOSC members before the November teleconference. Dr. Schnoor suggested that the BOSC discuss this topic at the next meeting. He asked the members to identify the standing subcommittee (first and second choices) on which they would like to serve. He also requested that the BOSC members identify other individuals who would be appropriate for the subcommittees. Dr. Preuss suggested that the list of approximately 100 candidates who were considered for the BOSC may be a good source of names. Dr. Schnoor asked the BOSC members to review the original Laboratory/Center review reports. Ms. Campbell agreed to e-mail the Laboratory/Center Review reports to the new BOSC members. The BOSC will develop preliminary questions that examine the impact of the BOSC's recommendations. The standing subcommittees also will review strategic plans, consult on workforce planning, and begin gathering data on communications and metrics of organizational behavior change. Dr. Schnoor indicated that the BOSC also will look at the multiyear planning process and select two plans for detailed review.

Dr. Brown agreed to maintain contact with the NAS committee working on the STAR Program review. She suggested that the BOSC agree to participate in this review if NAS is willing to include a BOSC member on the review committee. Dr. Brown indicated that she would be willing to serve in that role. Dr. Schnoor asked for a volunteer to serve as Dr. Brown's backup. Drs. Windom and Bostrom agreed to serve as backup.

Dr. Bostrom suggested forming a subcommittee for communications. She noted that the members of this subcommittee will want to provide input on the list of questions. Drs. Bostrom, Clark, and Zimmerman volunteered to serve on the communications subcommittee. Dr. Bostrom said that the subcommittee should have three additional members selected from outside the BOSC. Dr. Preuss suggested that a note be sent to the BOSC members who were not present to solicit their subcommittee preferences. Dr. Windom suggested that the Communications Subcommittee examine communications between ORD and the Regions. Dr. Schnoor proposed that this subcommittee assess the effectiveness of the Regional Scientists. Dr. Oppelt mentioned that there is a Regional Science Council established by the Regions; there are plans for a joint meeting of ORD's Science Council and the Regional Science Council to discuss how to improve communication between ORD and the Regions. He noted that the meeting will be open and BOSC members can attend.

Dr. Bus mentioned that the BOSC should examine how ORD is interacting with NSF's environmental efforts. How will NSF's ecocomplexity efforts be merged with ORD's efforts? He suggested that the BOSC also assess the balance of research within ORD. Is ORD moving beyond command and control research? Is there an appropriate balance between health-based approaches and technological approaches? Dr. Bostrom indicated that there will be numerous organizational challenges to overcome with regard to working with NSF. Dr. Bus commented that the BOSC should ensure that the programs are not in conflict with each other. Dr. Preuss indicated that EPA is troubled by the fact that NSF was the only federal agency invited to participate in the meeting at NAS to discuss the environmental research agenda for the future. He noted that EPA's strategic plan mentioned a national research agenda for the environment.

Dr. Preuss pointed out that the important issues 30 years in the future—such as habitat and species diversity, urban sprawl—are not high priorities now. Dr. Bus agreed and indicated that the BOSC should be helping ORD determine how to shift the focus. Dr. Oppelt noted that ORD needs input on workforce and portfolio planning. He pointed out that the staff hired today will be the senior scientists 10-20 years from now. Dr. Preuss mentioned the plum colored book, and said that ORD is thinking about how to implement some of the suggestions in that book. Dr. Schnoor mentioned that some of the BOSC members did not receive a copy of the book. Ms. Hamilton said that copies of the book had been sent out and should be received soon. Dr. Oppelt suggested that ORD brief the BOSC on its proposed plans and solicit some informal input from the BOSC.

ORD Strategic Plan 2000

Dr. Oppelt thanked the BOSC members for taking the time to review the strategic plan. He reminded the BOSC members that he briefed them on the plan about 12 months ago. At that time, the BOSC members asked to see the draft report before it was finalized, and this briefing is to followup on that request. He noted that the five goals and the major high priority research goals remain the same as in the previous draft. Dr. Oppelt explained that this plan incorporates organizational goals—how ORD should be structured, the staff, culture, and values—that complement ORD's scientific and technical goals. The primary audience for the strategic plan is ORD staff, and the plan is designed to ensure that everyone is heading in the same direction. It is not a detailed action plan that describes how ORD will do the research. Dr. Oppelt noted that ORD already is working on many of the actions in the plan. He mentioned that additional graphics will be added to the plan before it is printed.

The plan has been reviewed within the Agency and the comments have been incorporated. Dr. Oppelt said that the goal areas were prepared by teams with some top-down guidance from the Laboratory/Center Directors. He asked the BOSC to comment on:

- ❖ Overall impressions
- ❖ Best elements
- ❖ Elements needing improvement
- ❖ Actions/elements missing
- ❖ Are research/science priorities adequately explained/linked?
- ❖ Are bolder objectives achievable (e.g., National Research Agenda)?
- ❖ BOSC followup on certain activities
 - Workforce, metrics, communication
 - Any specific written comments.

Dr. Oppelt indicated that the next steps are to solicit comments from the SAB and to prepare implementation plans. These plans will contain the details on how ORD plans to conduct the research. Dr. Oppelt asked the BOSC members for their comments.

Dr. Zimmerman commended ORD for incorporating metrics in the plan, but she found it difficult to relate and map goals, trends, objectives, and metrics. She suggested adding a diagram to show the relationships. She liked the section that explained the meaning of the goals. Dr. Oppelt responded that the previous draft contained lists, but to eliminate duplication, the information was placed in the section on the goal. Dr. Zimmerman mentioned that the goals are overlapping.

Dr. Bostrom also had difficulty mapping objectives and metrics. She suggested adding a table at the end of each section to link metrics with actions. Dr. Oppelt replied that a previous draft included measures for each action, but it made the report too long. He agreed to look at the plan to determine if there is a better way to show the relationship between metrics and actions. Dr. Bostrom was very positive about the plan. Dr. Oppelt suggested adding a statement to the front end of the plan indicating that it does not contain information on budget and detailed plans. Dr. Bostrom liked the trends identified in the plan, and suggested that the URL for the larger document be added to the plan.

Dr. Brown liked the discussion of Goal 5. She noted that many strategic plans do not address future issues. She agreed to read the plan more carefully and provide specific comments. Dr. Windom also liked the section on the future, but he stressed the importance of the implementation plans. Dr. Zimmerman liked the measures of success in the plan and the fact that many are customer oriented; however, many of the measures are numbers and most will not predict whether the plan will have an impact. In addition, the plan does not define the customers. Dr. Oppelt replied that the measures in the plan are one step removed from improving health; ORD has to measure how the research impacted human health. Dr. Clark mentioned that it will take 20 years to demonstrate the real value of ORD's current efforts.

Dr. Stewart asked about the use of the terms "stakeholder," "customer," and "client." Dr. Oppelt replied that the terms "client" and "customer" are used interchangeably. "Stakeholders" include those affected by ORD's research, including environmental groups, other federal agencies, and industry. Dr. Bostrom was tasked by Dr. Small to present his comments. She said Dr. Small was concerned about the first circle on the diagram. If it is an example, then it is fine. If it is meant to be comprehensive, then it is too linked. Dr. Bostrom noted that a different version of the diagram is in the plum book, which is less linear than the one in the Strategic Plan 2000. She commented that the diagram does not address control options. Dr. Oppelt replied that the diagram was added at the last minute and it has not been peer reviewed. Dr. Bus stated that only the toxicological perspective is presented in the diagram. Dr. Bostrom noted that the recommendations in the report are not evident in the diagram. Dr. Oppelt asked

for suggestions for improving the diagram. Dr. Preuss indicated that ORD has better diagrams that could be used in the plan. Dr. Schnoor agreed that ORD could use the diagram in the plum book if it is revised to include ecology and R&D. Dr. Bus mentioned that he and Dr. Dorward-King developed a diagram at a SETAC conference that incorporated both ecology and human health. He agreed to send a copy of the diagram to Dr. Oppelt. Dr. Schnoor suggested that the Strategic Plan 2000 contain a few more examples that distinguish between core and problem-driven research. He noted that the plum book recommends a 50:50 ratio for core to problem-driven research. Dr. Bostrom asked why benchmarking was only used in section 2.4.7. It could be used in other areas.

Dr. Zimmerman said that the national research agenda, mentioned on pages 5-9 and 5-10, should be highlighted. It should be further developed and the plan should state that EPA is the leader in developing that agenda. Dr. Oppelt asked if that was achievable. Dr. Schnoor liked that section on emerging external trends (page 4-1). He noted that the plan does not include any discussion of politics and its impact on ORD's research program. Dr. Oppelt replied that it was not mentioned in the plan because it was not a focus of the stakeholder groups. Dr. Bostrom commented that such a topic may be more appropriate for the implementation plan. She asked if flat funding was assumed. Dr. Oppelt responded that no budget assumptions were made with regard to the plan. Dr. Schnoor noted that the plan does not mention Congressional earmarking and how it affects ORD. Dr. Preuss said that the level of earmarks for next year's budget will be approximately the same as last year (~\$40 million). He noted that ORD objects to earmarks in principle because there is no competition, and in practice because it reduces the budget available to implement ORD's program.

Dr. Brown commented that the research described in the plan is good, but it does not push the envelope. She suggested adding a few sentences about staying on the cutting edge and becoming a paperless office. Dr. Oppelt mentioned that ORD offers flexible hours and flexible work weeks to staff and this could be added to the plan. Dr. Brown asked about the organizational survey and Dr. Oppelt replied that 4 years of annual responses have been collected; however, the questions were not the same from year to year. Dr. Brown suggested making training and administrative requirements available on staff computers as well as all forms (e.g., travel request, expense form). Dr. Oppelt agreed that the plan should include the statement that ORD is moving toward a paperless office.

Dr. Bus said, with regard to Goal 2, that the science of the future is likely to be more multidisciplinary team oriented. Therefore, training is required to create high-performance teams. He noted that there will be less focus on the Principal Investigator and more on the team. There is a need to train teams to interact. Dr. Oppelt agreed and noted that it is a collateral point for Goal 4 as well. Dr. Bus commented that there is evidence that ORD appreciates the team approach in the PM Program. Dr. Preuss said that ORD has started to make progress in this area, but the shift is just beginning. Dr. Brown suggested that the goal statement be reoriented to include the idea of teams. Dr. Preuss agreed and Dr. Oppelt mentioned that this topic was discussed at the Baltimore, MD, meeting and should be added to the plan. Dr. Windom pointed out that a team focus may relieve some of the bad competition between ORD organizations.

Dr. Bus mentioned that Dow and GE have implemented an effort called "six sigma" (for one error out of six standard deviations), which stands for error-free data collection and analysis. Dr. Preuss suggested that this could be incorporated into Goal 5. Dr. Windom commented that scientists use models to predict what will happen in the future. Dr. Zimmerman pointed out that the focus should be on anticipating rather than forecasting. The key is anticipating what mechanisms must be in place to address future issues. Dr. Windom agreed that the plan should distinguish between prediction and forecasting. Dr. Preuss did not think the question was whether ORD should use models to predict; the question is whether ORD should be spending significant funds on predicting the next major issues. Dr. Oppelt pointed out that there is a need to predict technological changes as well as future problem areas. Dr. Windom noted that there will be many changes in U.S. demographics, changing the pressures in the southeastern United

States. He noted that scientists are working now to predict the impact of this change on coastal resources. Dr. Oppelt pointed out that ORD does not plan to invest a large amount of money in predicting and forecasting future issues, but it is necessary that some resources be devoted to this topic.

Dr. Brown mentioned that ORD may need to work with individuals beyond those with whom the Agency usually works. Dr. Windom said that the plan does not mention developing collegial relationships with researchers outside ORD. For example, under Goal 4 (section 4.2.1), the models and data sets could be made available to the scientific community, not just ORD. He stressed the need for ORD to engage academic scientists in its research efforts. Dr. Bostrom pointed out that access to data, data integration, and data security are important across domains and disciplines. In addition, the issue of using data in complex models is going to become paramount, and this is not mentioned in the plan.

Dr. Bostrom noted that the CENR and federal coordination should be mentioned under Goal 3. Dr. Oppelt agreed that the plan could be more explicit on this issue. She thought a NAS study on environmental research would be useful, but given the recent criticism of NAS studies, NSF may not be agreeable to such a study. She suggested that EPA take the lead in requesting a study on coordinating environmental research. Dr. Oppelt noted that after the research agenda is developed, it will be necessary to engage all the players (e.g., federal agencies, academia, states) to implement the research.

Dr. Bostrom mentioned an NSF report, entitled “Nature and Society,” which presents a future environmental agenda. She noted that it is on Ann Kinzig’s Web site and agreed to send the URL to the BOSC members. One concern about this report is that there were no behavioral scientists on the committee. Dr. Bostrom referred to another report—the National Science Board’s report entitled “Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation.” This report outlines an environmental research agenda for NSF.

Dr. Schnoor asked why the research priorities appeared in Chapter 6 of the plan and not earlier in the document. He noted, however, that placing them earlier would present too many details in the front of the plan.

Dr. Brown said that federal agencies do a bad job of telling the public the value they have brought to them. She suggested that the plan include three key ORD accomplishments. These should be three strong examples. For NASA, one would be “put the first man on the moon.” The plan should recite ORD’s top achievements. Dr. Preuss suggested that successes could be placed in sidebar boxes in the plan. Dr. Schnoor proposed including a list of what is better now and what is worse. Dr. Brown noted that measures of success are not in terms of improvements to health and environment. Dr. Zimmerman pointed out that it is more difficult to communicate successes than failures. Dr. Schnoor suggested a balance by identifying both good and bad things. Dr. Clark suggested mentioning some of ORD’s technological accomplishments. Dr. Bostrom mentioned that this would lead the way to formulating some grand challenges.

Dr. Bus said that the strategic research priorities are appropriate, but they may be too pollution oriented. For example, land use is not mentioned in the report; however, it will be a key focus in the future and it currently is a focus for NSF. He asked that the report be reviewed to determine if it is too pollution oriented. Dr. Oppelt mentioned that, when he briefed the Administrator on this approach, she preferred previous strategies. Therefore, ORD tried to include things that were similar to previous strategies. He noted that there are emerging priorities in the plan that are not very focused (e.g., watershed management). Dr. Bostrom noted that the plan does not mention sustainability or resiliency. Dr. Oppelt replied that the term “sustainability” was deliberately not used in the plan. ORD is looking at the environmental from a system perspective; it no longer uses sustainability because it places government into the position of regulating land use. Dr. Preuss pointed out that ORD’s sustainability efforts were initiated under a republican administration. Dr. Oppelt asked if the plan should identify the next

generation of emerging priorities. Dr. Bus thought that would be a good addition to the plan. Dr. Oppelt mentioned that microbes and pathogens, risk communication, and socioeconomics are some of the future priority areas. He agreed that these should be identified in the report. Dr. Brown suggested adding that, in the future, more energy will be generated at the place where it is consumed; this will allow consumers to make use of excess heat, etc. She suggested that ORD give some thought to where its agenda would fit with future changes.

Dr. Oppelt stated that the international demand for information on environmental technologies and risks will be enormous, and the plan does not mention this. Dr. Windom mentioned diseases brought in through ports. This requires that ORD be connected to the international scientific community. EPA should be in a position to influence the world, especially in areas that could threaten national security. Dr. Brown pointed out that the global market makes the United States more vulnerable. Dr. Windom agreed and provided the example of importing food from other countries that use pesticides that are banned in the United States.

Dr. Bostrom asked if ORD is plugged into the International Forecasting Association. This is a professional association that focuses only on forecasting. The Association's next meeting will be in Atlanta in June 2001. She suggested that a group from that Association may be willing to discuss future issues with ORD. Dr. Preuss said that there is a futures group within EPA, but it does not receive much support in the Agency. Dr. Oppelt indicated that ORD will need to work with associations and groups, such as the International Forecasting Association, when implementing anticipatory research efforts.

Dr. Oppelt thanked the BOSC members for their insightful comments and indicated that ORD will work to incorporate them into the plan. He asked members who have specific written comments to provide them to Ms. Hamilton. Dr. Clark mentioned that he notices a typographical error in the organizational chart. He noted that Narragansett had been moved to Corvallis. There also are two management deputies under the National Center for Environmental Assessment (NCEA).

Next BOSC Meeting

Dr. Schnoor asked members to check their calendars to determine if they are available for the following dates: January 22-23, 2001; January 29-30, 2001; and February 5-9, 2001. He asked that the members notify Ms. Hamilton of their availability. He reminded the BOSC members that there will be a teleconference on November 16 at 10:30 a.m. (EST) to approve the final draft of the PM report.

Approval of May Meeting Minutes

Dr. Schnoor asked if there were any comments on the May meeting minutes. When no comments were provided, he asked for a motion to approve the May minutes. Dr. Brown moved that the minutes be approved and Dr. Bus seconded the motion. The minutes were approved unanimously by the Board.

Dr. Bus moved to adjourn the meeting, and Dr. Stewart seconded the motion. Dr. Schnoor then adjourned the meeting.

Action Items

The following action items were identified during the meeting discussions:

- ❖ BOSC members should notify Dr. Schnoor if they are available and willing to attend the November 1, 2000, SAB meeting.

- ✧ The BOSC members should provide editorial changes for the PM report to Dr. Schnoor following the meeting.
- ✧ Dr. Small agreed to prepare several sentences to clarify that specific metrics for PM are considered in terms of impact on scientific literature, regulatory programs, etc.
- ✧ Dr. Bus agreed to prepare several sentences with regard to the fact that ORD must have the ability to evaluate STAR investigators to ensure that technology and information are transferred into the PM Program.
- ✧ Dr. Schnoor agreed to consult the Integration Subcommittee to clarify several issues with regard to Chapter 1 of the PM report.
- ✧ Dr. Schnoor agreed to revise the PM report based on the BOSC's comments and work with Dr. Preuss and Ms. Campbell to finalize the report.
- ✧ Dr. Schnoor agreed to circulate the revised PM report to the BOSC members for final review.
- ✧ Dr. Schnoor agreed to prepare the cover letter to Dr. Noonan to accompany the PM report.
- ✧ Ms. Hamilton agreed to schedule a conference call for November 16 at 10:30 a.m. (EST) to approve the final draft of the PM report.
- ✧ The BOSC agreed to select two multiyear plans for review from the five pilot plans. Ms. Hamilton agreed to circulate the five draft plans to the BOSC members as soon as they are available.
- ✧ The BOSC agreed to establish five standing subcommittees—one for each Laboratory/Center and to followup on the original Laboratory/Center reviews. The BOSC members should provide their preferences with regard to these subcommittees to Dr. Schnoor.
- ✧ Ms. Campbell agreed to e-mail copies of the original Laboratory/Center Review reports to the new BOSC members.
- ✧ Dr. Brown agreed to maintain contact with the NAS committee conducting the STAR Program review and she volunteered to serve on that committee if possible. Drs. Windom and Bostrom agreed to serve as Dr. Brown's backup on the committee.
- ✧ Drs. Bostrom, Clark, and Zimmerman volunteered to serve on the Communications Subcommittee.
- ✧ Dr. Schnoor agreed to contact the BOSC members who were not present at the meeting to obtain their subcommittee preferences.
- ✧ The BOSC members agreed to provide any additional comments on the Strategic Plan 2000 to Ms. Hamilton.
- ✧ Dr. Bus agreed to send a copy of the diagram that he and Dr. Dorward-King developed at at SETAC conference to Dr. Oppelt.
- ✧ Dr. Bostrom agreed to provide the URLs for the reports "Nature and Society" and "Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation" to the BOSC members.

- ✧ Dr. Schnoor asked the BOSC members to notify Ms. Hamilton of their availability for the following dates: January 22-23, 2001; January 29-30, 2001; and February 5-9, 2001, so that the next BOSC meeting can be scheduled.

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ATTACHMENT 1:
Suggested Topics for BOSC Activities
FY 2000 and FY 2001

SUGGESTED TOPICS FOR BOSC ACTIVITIES FY 2000 AND FY2001

1. Laboratory science management and operations
 - a. Should the BOSC created standing laboratory/center committees?
 - b. Should the BOSC follow-up on the original self-studies?
 - i. How?
 - ii. When?
 2. Multi-year Plans
 - a. Advice on format/content
 - b. Review of draft plans
 - i. Is there an appropriate balance in each of the multi-year plans between problem-driven and science-driven research?
 - ii. Do the multi-year plans present an understandable and intellectually integrated picture of the research that is to be done?
 - iii. Does the format lead to the kind of GPRA orientation and accountability that the BOSC has discussed previously?
 3. Workforce Planning
 - a. Advice on ORD approaches
 - b. Review of specific laboratory/center plans
 - c. Are our workforce plans adequately taking into account both short-term and long-term needs?
 4. Reviews of Research Strategies/Plans?
 - a. Overview of integration of ORD's program
 5. Portfolio turnover
 - a. Is ORD turning over its research portfolio to ensure that projects end at the appropriate time, and that new efforts are started in a timely manner?
 6. Communication
 - a. Within ORD
 - b. With Program Offices and Regions
 - c. With the academic community
 - d. With other interested parties
- This is an issue that has been raised on a number of previous reviews of STAR and the ORD Program generally. A number of initiatives are underway, but questions remain to be answered about their effectiveness.
7. Effectiveness
 - a. To what degree are research products used by EPA, the states, etc.
 - b. Are ORD products providing the basis for Agency decisions?

8. How can we better measure the quality of science that ORD is producing?
 - a. Papers published in the peer review literature
 - b. Citations
 - c. Other metrics

9. NAS Review of STAR
 - a. BOSC participation?
 - i. Roles
 - ii. Activities