

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

**BOARD OF SCIENTIFIC COUNSELORS
EXECUTIVE COMMITTEE MEETING**

**Arlington, Virginia
February 8 - 9, 1999**

Monday, February 8, 1999

Introduction/Overview of the Meeting

Dr. Costel Denson (University of Delaware), Chair of the Board of Scientific Counselors (BOSC) Executive Committee, called the meeting to order at 1:00 p.m. He expressed his appreciation to the BOSC members in attendance and offered a special welcome to Dr. Norine Noonan (AA/ORD). Dr. Denson quickly reviewed the agenda, and provided a brief history of the BOSC for the benefit of the BOSC and other participants.

History of the BOSC

May 1996: The BOSC was chartered as a Federal Advisory Committee Act (FACA) committee, and the BOSC Executive Committee was established with 15 members.

August 1996: The first meeting was held; in addition, the first major BOSC undertaking was identified. Then AA/ORD Dr. Robert Huggett charged the BOSC to review ORD's Research Plan for Arsenic and Drinking Water. The effort, which was chaired by Dr. Jerald Schnoor (University of Iowa), resulted in a report that was approved by the BOSC Executive Committee and transmitted to the AA/ORD. The second major endeavor of the BOSC was to perform programmatic reviews of the ORD Laboratories and Centers. Dr. Denson mentioned that the programmatic reviews, completed in early 1998, helped the Executive Committee to unite as a team.

March 1998: Dr. Denson testified before the House of Representatives Energy and Environment Subcommittee regarding the state of ORD. During his testimony, Dr. Denson conveyed the conclusions of the BOSC reviews, both the review of the Research Plan for Arsenic and Drinking Water and the reviews of the ORD Laboratories and Centers.

May 1998: The BOSC charter was considered for renewal.

August 1998: The BOSC charter was renewed for an additional 2 years, and a BOSC Executive Committee meeting was held in August 1998. Dr. Denson noted that he and Ms. Shirley Hamilton (DFO) have approved the meeting summary.

December 1998: Dr. Noonan, who was sworn in as the AA/ORD on October 20, 1998, conferred a new charge to the BOSC—to perform a review of ORD's Particulate Matter (PM) Program (the charge, included as Attachment 2, will be discussed later in the meeting).

Dr. Mitchell Small (Carnegie-Mellon University) mentioned that the *Ad Hoc* Subcommittee members who participated in the reviews of the Laboratories and Centers have not received copies of the final reviews. Dr. Denson suggested that a letter be sent to each Subcommittee member explaining the status of the reviews and

thanking them for their participation. The Executive Committee agreed to this proposal, and Dr. Denson volunteered to draft the letter. Dr. Denson indicated that a written response from the Laboratories/Centers regarding the reviews would be useful to facilitate Laboratory/Center feedback, and he agreed to prepare a transmittal letter to the AA/ORD for the reports. Dr. Denson, as Executive Committee Chair, and the Subcommittee Chairs will sign the transmittal letter. He agreed to initiate circulation of the letter to the Subcommittee Chairs. Each Chair will sign the letter and send it to Ms. Hamilton, who will deliver it to the AA/ORD.

Dr. Denson noted that there have been some problems with EPA's direct deposit process for paying the BOSC members. He commented that EPA is not sending him an e-mail message when a direct deposit is made. Dr. William Cooper (Michigan State University) indicated that he receives a hardcopy of direct deposit transactions made by other institutions, which he finds quite helpful. The BOSC agreed that it would be helpful to receive a notification of deposit from EPA. Dr. Schnoor added that he finds the EPA's deposits confusing as they do not specify the nature of the payment, for example, consulting fees or travel reimbursement. Ms. Hamilton agreed to look into these matters.

Minutes of August 17-18, 1998, BOSC Executive Committee Meeting

BOSC members had no comments on the meeting summary; therefore, Dr. Small moved that the summary from the August 17-18, 1998, BOSC Executive Committee meeting be approved. Dr. Cooper seconded the motion, and it was approved unanimously.

New BOSC Members

The BOSC was originally chartered with 15 members, but currently has 11 members since Dr. Howard Berghmann and Dr. Sheila Jasenoff (Cornell University) resigned from the Board. Dr. William Pierson (Desert Research Institute) has resigned due to illness, and Dr. Robert Howarth (Cornell University) and Dr. Brian Leaderer (Yale University) have rotated off the Board. As discussed during the last BOSC meeting, the Executive Committee would like to increase the diversity of the BOSC by appointing qualified women and underserved minorities. Dr. Denson has contacted a number of candidate members who would address that need. He was pleased to inform the Executive Committee members that two individuals—Dr. Bonnie McCay (Rutgers University) and Dr. Ann Bostrum (Georgia Institute of Technology) have accepted appointments to the BOSC Executive Committee, and Ms. Hamilton has initiated the process to complete their appointments to the BOSC. Dr. Denson informed the Executive Committee that Dr. Pamela Matson and Dr. Steve Carpenter have declined appointments; however, Dr. Matson did agree to serve on an *Ad Hoc* Subcommittee if needed. Dr. Denson indicated that he will discuss potential BOSC appointments with five additional persons. In response to an Executive Committee member's question, Dr. Denson indicated that the goal was to return to a 15-member Board.

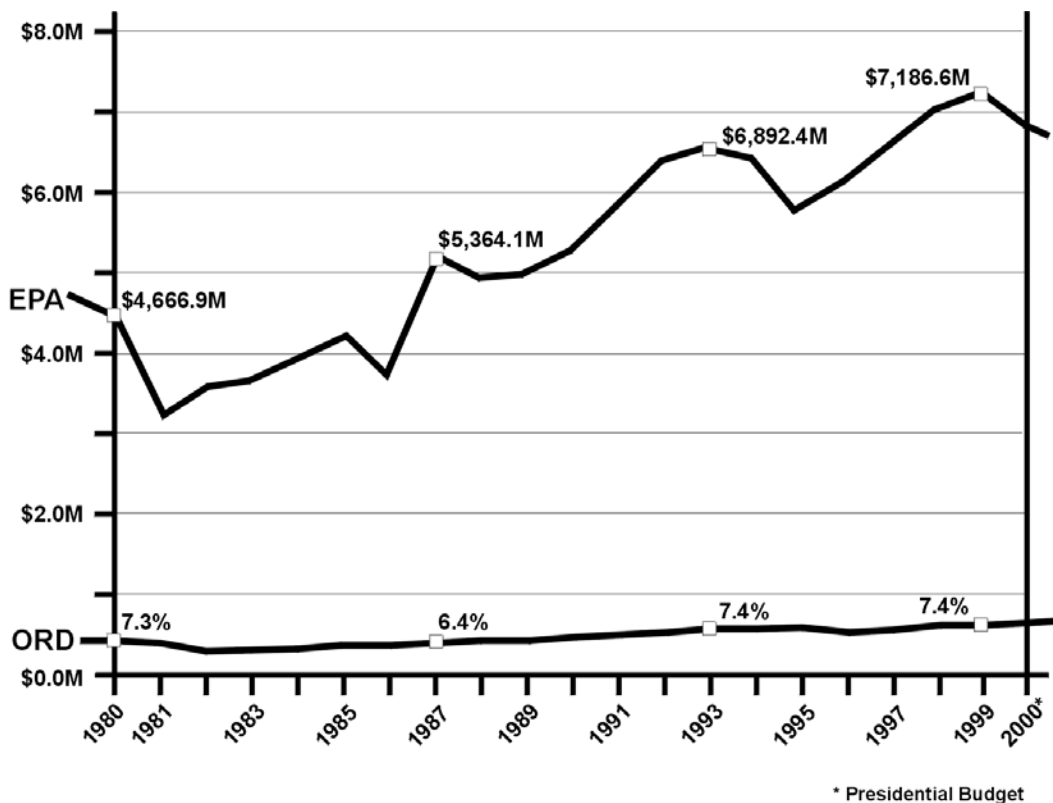
State of ORD

Dr. Noonan thanked the Executive Committee for the opportunity to attend today's meeting and briefly mentioned some of her activities prior to appointment as AA/ORD. From 1982-1992, Dr. Noonan was with the Office of Management and Budget (OMB). In 1992, she accepted a position at the Florida Institute of Technology, which she resigned on acceptance of the position as AA/ORD. Dr. Noonan also has served on the National Aeronautics and Space Administration's (NASA) Space Sciences Advisory Committee and the National Science Foundation's (NSF) Advisory Committee for Social Behaviors and Economic Sciences. Because the NASA Committee is composed solely of nongovernment officials, she has resigned that position. However, Dr. Noonan has retained her membership on the NSF Committee, and believes that it will be beneficial as it provides an opportunity for ORD to provide direct input to NSF. Dr. Noonan invited the BOSC members to stop by her office to discuss any matters of interest.

Regarding the ORD budget, Dr. Noonan indicated that it has remained fairly constant over the last 20 years; the budget has ranged from 7.4 percent to 6.4 percent of the total EPA budget during that time (see Exhibit 1). Dr. Noonan noted that EPA's FY2000 budget appears to be smaller than previous years; however, it does not reflect Congressional earmarks which EPA does not sustain within its budget each year. Therefore, EPA's FY2000 budget is expected to increase once the Congressional earmarks, which totaled \$400M in FY 1999, have been included.

Exhibit 1. ORD Budget as a Percentage of Total Agency Budget

1980 - 2000



The following timeline to approve the EPA budget was provided:

February 1, 1999: The budget was provided to Congress.

February 11, 1999: Dr. Carol Browner, the EPA Administrator, will testify before the Senate Oversight Committee on the EPA budget.

March 18, 1999: The House Sciences Committee will hold hearings on ORD's budget. At this hearing, Dr. Noonan, Science Advisory Board (SAB) officials, and other outsiders will testify. Dr. Noonan commented that Dr. Denson participated in the hearing last year.

April 13-14, 1999: The House Appropriations Committee will meet to consider the EPA budget.

April 29, 1999: The Senate Appropriations Committee will meet to consider the EPA budget. Shortly thereafter, the EPA budget will be determined for FY2000. Dr. Noonan indicated that once Congress enacts

the EPA budget, the Agency will create an operating plan that is provided to OMB for approval. Upon OMB approval, the budget is returned to Congress and a final approval letter is transmitted to EPA.

The EPA FY2000 budget includes several innovative programs developed by the Clinton Administration that bring together communities and businesses in creative ways to leverage resources that build healthier communities and healthier local economies. Three such programs were described by Dr. Noonan:

- Better America Bonds. This new, innovative, financial tool is aimed at helping communities address problems associated with urban sprawl—like traffic congestion, lost farmland, threatened water quality, shrinking parkland, and abandoned industrial sites or Brownfields. The Administration is proposing \$700 million in tax credits over 5 years that will support \$9.5 billion in bond authority for investments by state, local, and tribal governments. These bonds will give local communities maximum flexibility and resources to address their most pressing environmental needs.
- Clean Air Partnership Fund. The budget includes \$200 million for a new Clean Air Partnership Fund—an initiative that is part of the Administration’s efforts to clean the Nation’s air and meet the challenge of global warming. The Fund will promote innovative technology to help communities nationwide reduce harmful air pollution and greenhouse gases. It finances the creation of partnerships among local communities, states, tribes, the private sector, and the federal government. These partnerships are designed to finance projects that are locally managed and self supporting and enable communities to achieve their clean air goals sooner. The Fund will stimulate cost-effective pollution control strategies, spur technological innovation, and leverage substantial nonfederal investment in improved air quality.
- Fighting Childhood Asthma. Dr. Noonan indicated that EPA is taking a leadership role as part of an Administration-wide effort to address the growing problem of childhood asthma. The FY2000 Presidential EPA Budget provided an additional \$17.4 million, for a total of \$22.2 million, to reduce children’s exposure to toxins in the environment that can exacerbate asthma. The funding will implement an interagency initiative for education, outreach, and air monitoring. An additional \$12.3 million, for a total of \$40.1 million, focuses on other chronic childhood afflictions, such as cancer and developmental disorders. EPA’s investment to protect children from environmental threats totals \$62.3 million.

Dr. Noonan indicated that the EPA Budget is goal oriented in accordance with the Government Performance and Results Act (GPRA), and ORD has a presence in most of EPA’s goals (see Table 1). She commented that changing the framework of the budget toward GPRA goals was challenging. In response to Dr. Cooper’s question, Dr. Noonan indicated that she was unsure if EPA is supporting research to investigate microbes in food, or if the research is constrained to pesticides (see Goal 3). She added that other federal agencies, for example, the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA), address this issue. Dr. Cooper asked why Goal 4 (Healthier Indoor Air) was not funded in the Presidential EPA Budget. In response, Dr. Noonan indicated that ORD would like to integrate “indoor” and “outdoor” environments for research purposes. Doing so eliminates what was perceived as an artificial distinction that served to restrict efforts. A number of research teams must now consider the indoor environment with respect to their efforts. Dr. Peter Preuss (EPA/NCERQA) added that it is difficult to identify precisely where the old indoor air program components have been placed, but he added that indoor air research will not be neglected. Dr. Noonan acknowledged that it may be difficult to retain accountability for indoor air research, but EPA refrained from identifying it as a separate line item because of the concern that such research would be neglected by certain programs on the assumption that it was being performed under the indoor air program.

Dr. Noonan noted that the FY2000 Presidential ORD Budget (\$534.8M) is smaller than the FY99 enacted budget (\$562.8M), but reminded the BOSC that the Presidential Budget does not include Congressional earmarks. She expects that the FY2000 budget will be slightly greater than the FY99 budget. In response to Dr. Loehr’s (University of Texas) comment, Dr. Noonan indicated that ORD will determine how to

incorporate the earmarks into the ORD budget once the enacted budget is received. She stressed that ORD will endeavor to retain a funding structure that provides EPA the best opportunity to meet its goals.

Table 1. ORD's Role in EPA Goals

Goals	FY1999 Enacted Budget (\$M)	FY2000 Presidential Budget (\$M)
<i>Goal 1: Clean Air</i> • Attain NAAQS for Ozone and PM • Reduce Emissions of Air Toxics	75.7 19.7	69.1 20.6
<i>Goal 2: Clean and Safe Water</i> • Safe Drinking Water, Fish, and Recreational Waters • Conserve and Enhance Nation's Waters • Reduce Loadings and Air Deposition	47.7 19.5 8.4	41.5 20.0 8.7
<i>Goal 3: Safe Food</i> • Reduce Use on Food of Pesticides Not Meeting Standards	6.4	6.6
<i>Goal 4: Preventing Pollution and Reducing Risk in Communities, Homes, Workplaces, and Ecosystems</i> • Safe Handling and Use of Commercial Chemicals and Microorganisms • Healthier Indoor Air	11.2 2.8	11.5 0.0
<i>Goal 5: Better Waste Management, Restoration of Contaminated Waste Sites, and Emergency Response</i> • Reduce or Control Risks to Human Health • Prevent, Reduce, and Respond to Releases, Spills, Accidents, or Emergencies	48.4 6.6	41.5 7.2
<i>Goal 6: Reduction of Global and Cross-Border Environmental Risks</i> • Climate Change	16.7	22.5
<i>Goal 7: Expansion of Americans' Right to Know About their Environment</i> • Enhance Ability to Protect Public Health	11.5	12.9
<i>Goal 8: Sound Science, Improved Understanding of Environmental Risk, and Greater Innovation to Address Environmental Problems</i> • Research for Ecosystem Assessment and Restoration • Research for Human Health Risk Assessment • Research to Detect Emerging Risk Issues • Pollution Prevention and New Technology for Environmental Protection	111.4 50.3 49.2 76.6	118.5 56.2 42.3 55.4
Office of Research and Development	562.3	534.8
Climate Change Technology Initiative	109.5	216.4
Total	671.8	751.2

Dr. Noonan indicated that there are two new initiatives within ecosystems research (Goal 8)—Coastal Integration and the Integrated Science for Sustainable Ecosystems Initiative (ISEC). The ecosystems research is an effort to consider the entire U.S. coast in an integrated fashion. She added that some of the effort will be undertaken by the Environmental Monitoring and Assessment Program (EMAP)—EMAP will focus on the Gulf Coast and Mid-Atlantic Coast. The second initiative, ISEC, is a multi-agency effort (National Oceanic and Atmospheric Administration [NOAA], Department of Energy [DOE], Department of Interior [DOI], EPA, and others) that will investigate a variety of ecosystem stressors and Dr. Noonan indicated that EPA will play a large role in information dissemination. Dr. Noonan indicated that EPA has an increased involvement in global change and she suggested that Dr. Joel Scheraga (EPA) attend the next BOSC meeting to discuss EPA's involvement on this front. Dr. Noonan indicated that a Program Manager, who will ensure that the program remains on track, will be designated for the Drinking Water Program in the near future.

Dr. Cooper asked what percentage of research within EPA is managed by ORD. Dr. Noonan responded that EPA's Science Policy Council has created an inventory of all scientific activities within EPA and that the inventory could be used to answer such a question. Dr. Noonan also noted that the definition of "science" can be interpreted in many ways. After consideration of the inventory, the Science Policy Council will prepare an overall EPA plan for science that will transcend ORD's Strategic Plan. In response to an Executive Committee member's request, Dr. Noonan agreed to provide BOSC members with a copy of the Science Policy Council's Peer Review Handbook, which provides guidance on the definition of "peer review." Dr. Noonan mentioned that the handbook is a very useful resource.

Dr. Loehr noted that Research to Detect Emerging Risk Issues (Goal 8: Sound Science) decreased from \$49.2M to \$42.3M. He pointed out that EPA is best qualified to do this research, and urged EPA to reconsider the reduction. Dr. Noonan responded that ORD will strive to meet this, and all other objectives, within budgeting constraints.

Science To Achieve Results (STAR) Program Resources. Dr. Noonan indicated that the PM Program received the largest funding increase—the FY99 budget provided \$7.1M for PM research under the STAR Program; the FY2000 Presidential Budget allocates \$14.4M. The Human Health Protection budget also received a large increase (\$11.6M→\$17.8M). Dr. Schnoor noted that the Tropospheric Ozone budget was reduced (\$5.3M→\$0.5M); Dr. Noonan responded that it was a difficult decision, but the budget was adjusted based on the priority level assigned to that area. She added that there will be some overlap between the Tropospheric Ozone Program and the PM Program. Dr. Cooper noted that the Indoor Air and Chemicals/Microorganisms areas were not funded. Dr. Noonan responded that these research topics are addressed in other areas.

In response to Dr. Rae Zimmerman's (New York University) question, Dr. Noonan indicated that EPA funding within the Global Change area is to support risk assessment research; as EPA is best qualified to perform work in this arena. She indicated that in comparison to other federal agencies' programs, EPA is a small player in the Global Change Program.

Dr. Denson noted that the SAB is considering whether a review of the STAR Program, which was initiated 5 years ago, should be performed. He asked for the opinions of the Executive Committee members on this matter. Dr. Noonan suggested that it may be worthwhile to review the STAR Program in terms of process, for example, solicitation and evaluation of proposals. However, she was not sure the Program was sufficiently mature for an evaluation based on its outputs, and Dr. Denson agreed. She added that STAR grantees had conducted only 3-4 years of research. Dr. Noonan noted that the EPA Administrator is very supportive of the STAR Program. She indicated that, to a certain extent, the STAR Program and the Graduate Fellowship Program represent the external intellectual future of EPA. Dr. Small noted that the BOSC review of NCERQA considered the STAR Program as it relates to NCERQA. He suggested that, if reviewed by the BOSC or SAB, that a different perspective be sought.

Dr. Noonan asked to attend the wrap-up portion of tomorrow's session of the BOSC meeting. Doing so would provide her an opportunity to address any questions, and to act on any action items. Dr. Denson indicated that Dr. Noonan would be welcome to attend tomorrow's session.

Ad Hoc Subcommittees

Dr. Denson reminded the members about previous discussions regarding the development of a cadre of consultants to draw upon for appointment to *Ad Hoc* Subcommittees. However, non-BOSC members must be renewed each year to remain active consultants to the BOSC. Ms. Hamilton mentioned that the non-BOSC members that participated in the Laboratory/Center Reviews were not reappointed. A substantial amount of paperwork is required to reappoint each consultant, which places a burden both on ORD and the consultants. Dr. Schnoor asked if more effort was required to renew each consultant every year or to renew them on an as needed basis—Ms. Hamilton indicated that the level of effort was comparable. It was noted that the SAB maintains hundreds of consultants—Ms. Hamilton agreed to determine how these consultants are maintained. Dr. Cooper reminded the BOSC that it desired flexibility regarding the appointment of *Ad Hoc* Subcommittee members; this will be achieved most easily by maintaining an active list of consultants. Ms. Hamilton agreed to determine the best method to do this, and Dr. Preuss indicated that EPA will provide the BOSC with the support it needs to function effectively.

Dr. Cooper noted that Attachment 2 of the August 17-18, 1998 BOSC Executive Committee Meeting Summary states that the BOSC Subcommittee Co-Chairs should be available for Laboratory/Center-specific consultation. He asked if that statement is still valid—the Executive Committee agreed that the written responses from the Laboratories/Centers should address this issue. Dr. Preuss added that each of the Laboratories and Centers are preparing responses to the BOSC reviews, which will be transmitted to the Board within the next 4 weeks.

An Executive Committee member asked if the BOSC should verify that its recommendations are being met by the Laboratories/Centers. Dr. Marilyn Brown (Oak Ridge National Laboratory) believed that ongoing interactions will help accomplish this. In response, Dr. Zimmerman suggested that the BOSC delay any significant interaction until the Laboratories/Centers have responded to the reports, which state their intentions regarding the recommendations. Dr. Cooper expressed concern that the written responses may not be completely forthcoming regarding more sensitive issues, for example, the communication disconnect between managers and scientists. Dr. Schnoor agreed, and added that the Laboratory/Center officials may appreciate the opportunity to discuss issues directly with the BOSC (both in response to the reviews and to discuss new issues). However, Dr. Schnoor also commented that such interaction could command appreciable time and resources. Dr. Loehr agreed, but added that continued interaction could be of great value. He suggested that a specific role be identified for the BOSC, because the Board functions most effectively when a specific charge is identified. Dr. Jim Bus (Dow) suggested that the Review of the PM Program be structured to determine to what extent the recommendations are being implemented. For example, the BOSC recommended that each Laboratory/Center develop a strategic plan—the Review of the PM Program would be an opportunity to determine if the strategic plan has been developed. Dr. Preuss responded that each Laboratory/Center is developing a strategic plan, which will be submitted to the AA/ORD once completed. Dr. Small suggested that the BOSC revisit the Laboratories/Centers every 2 years, at which time the Laboratories/Centers could provide updates regarding the implementation of the recommendations. Dr. Denson noted that BOSC must be rechartered every 2 years; he suggested that the BOSC focus on the Review of the PM Program, and revisit the Laboratories/Centers during the PM Program Review if appropriate. Dr. Brown believed that, because of the periodic changes within BOSC and within the Laboratories/Centers, that continual interaction was preferable and suggested that merging it with the PM Program Review was a reasonable solution. Dr. Cooper noted that the initial Laboratory/Center review was constrained to management; BOSC members held discussions with only a few staff scientists. The PM Program, however, will be integrated across scientific issues, which should allow the BOSC to address different aspects of the Laboratories/Centers. Dr. Schnoor suggested that the issue of interaction be tabled until the BOSC receives the Laboratory/Center responses. Dr. Denson suggested that the BOSC may have completed its role when

the reports of the Laboratories/Centers reviews were submitted to the AA/ORD. However the BOSC will respond to the AA/ORD based on the responses from the Laboratories/Centers. He added that it is not necessarily within the charge of BOSC to determine if/how the Laboratories/Centers are implementing the BOSC recommendations. Dr. Denson provided the following summary points based on the discussion:

- A formal mechanism to revisit the Laboratories/Centers will not be established at this time.
- The responses of the Laboratories/Centers will be measured against the BOSC recommendations.
- The Review of the PM Program may provide an opportunity to continue dialogue with the Laboratories/Centers.

Based on Dr. Schnoor's suggestion, the Executive Committee agreed that discussion of Attachment 2 of the August 17-18, 1998, BOSC Executive Committee Meeting Summary be tabled until responses are received from the Laboratories/Centers.

Scientific Advisory Board Update

Dr. Denson welcomed Dr. Donald Barnes (SAB), who provided an overview of recent SAB activities and upcoming plans. He provided the BOSC with a copy of the FY1998 SAB Annual Staff Report, and indicated that the BOSC members will receive a copy of the SAB's monthly electronic newsletter, *Happenings at the SAB*. The SAB Executive Committee met on January 27-28, 1999, and provided BOSC members with a copy of the Actions and Instructions from the SAB Executive Committee Meeting. He brought Instruction 4 to the attention of the BOSC, which states:

“The Executive Committee instructed the Staff to work with Dr. Seeker, Dr. Denson, and the AA/ORD to arrange for an appropriate review of the STAR grants program, which would include consideration of earlier BOSC comments on the matter.”

The instruction charges the SAB to perform a review of the STAR Program, if appropriate. In addition, the SAB will work with the BOSC, initially using Dr. Denson as liaison, to implement the review. Dr. Cooper mentioned that the BOSC had discussed whether a review of the STAR Program was appropriate earlier in today's meeting. The BOSC concluded—and Dr. Preuss agreed—that the review would be premature with respect to standard output measurements (i.e., publications, cross-references, and other standard counting measures), but the STAR Program could benefit from a process review. Dr. Denson believed that, if the SAB reviews the STAR Program, that the review would benefit from BOSC participation. The SAB recommended that the SAB and the BOSC Co-Chair the review panel. In response to Dr. Denson's question, Dr. Barnes indicated that a specific charge for the review has not been identified. Dr. Denson suggested that Dr. Preuss prepare a charge to define the BOSC's role in the process. Dr. Preuss responded that it would be helpful for the BOSC to identify appropriate expectations for the STAR Program. He added that NSF and EPA reviewed the STAR Program's Technology for a Sustainable Environment Program about a month ago. Dr. Zimmerman suggested that the EPA Strategic Plan be considered during the review because it may provide a perspective regarding EPA's direction. Dr. Denson agreed to participate in a joint SAB/BOSC review of the STAR Program if it comes to fruition. However, he asked the BOSC what his charge would be; Dr. Barnes indicated that the BOSC is welcome to draft such a charge as it sees fit. Dr. Preuss, Dr. Cooper, and Dr. Brown agreed to develop a draft charge for consideration by the Executive Committee. Dr. Preuss indicated that he is making a presentation to the Research Strategies Advisory Committee (RSAC) on March 3-4, 1999, and it would be useful to have the charge prepared by that time.

Dr. Barnes noted that the SAB recognizes that it is one of many advisory committees to EPA, and is very interested in promoting interactions with other advisory committees. He pointed out that the SAB and the BOSC have developed a reciprocal relationship whereby the BOSC Chair attends SAB meetings and a representative of the SAB attends BOSC meetings. Dr. Barnes indicated that Dr. Gene McConnell, previous Chair of the Science Advisory Panel (SAP), and Dr. Ron Kendall (Texas Tech University), current Chair of the SAP, also have attended SAB meetings. In addition, the Chair of the Children's Health Protection

Advisory Committee, Dr. Roult Reigart (Medical University of South Carolina's Children's Hospital), has been invited to join the SAB as an *ex officio* member. Dr. Barnes added that the SAB has developed liaison activities on the committee level with a number of other advisory panels, including the SAP, the National Drinking Water Advisory Committee (NDWAQ), and the Health Council of the Netherlands.

Cancer risk assessment guidelines for children are of particular concern to the SAB at the present. Dr. Barnes commented that some individuals believe that EPA has not considered this issue sufficiently. To this end, a joint SAB/SAP review is under consideration. Dr. Barnes also mentioned that the SAB will testify before the Energy and Environment Subcommittee of the House Sciences Committee in early March regarding EPA's science budget. In preparation, the SAB has had discussions with the Office of the Chief Financial Officer.

Development of Candidate Member Pools

Dr. Small updated the BOSC on the development of candidate pools for membership to either the Executive Committee or *Ad Hoc* Subcommittees. Dr. Zimmerman was appointed to the Subcommittee coordinating efforts to find a replacement for Dr. Pierson. The candidate pools are under development. As noted, the BOSC is seeking women and underserved minorities to increase the diversity of the BOSC. Dr. Small provided BOSC members with details on the organization that he has contacted to identify potential candidates. The following suggestions were made regarding additional organizations to contact:

- Dr. Bus suggested that the Centers for Disease Control and Prevention (CDC) be contacted.
- Dr. Zimmerman suggested that the National Environmental Justice Advisory Council (NEJAC) be contacted.
- Dr. Zimmerman also suggested that the SAB should be contacted as they are very interested in this issue. Dr. Denson indicated that the SAB already has provided a list of names to him, and will forward a number of other names; he agreed to provide the list to Dr. Small.
- Dr. Denson suggested that the members of the National Association of Black Chemists and Chemical Engineers (NABCEE) be contacted—he agreed to provide a NABCEE roster to Dr. Small.
- Dr. Loehr suggested that the National Society of Hispanic Engineers be contacted.
- Dr. Brown suggested that the Hispanic Engineers Association be contacted.

Dr. Small asked that contact information for the organizations, or specific names, be provided to him by e-mail. Dr. Cooper asked that resumes of candidate BOSC members be provided for informational purposes, and Dr. Small agreed to compile resumes for prospective Executive Committee members and for prospective Subcommittee members for circulation to the Executive Committee.

In response to an Executive Committee member's question, Dr. Denson indicated his preference that new BOSC members be minorities rather than individuals representing minority issues. Dr. Schnoor agreed, and added that the BOSC needs to be comprised of diverse scientists as well. He suggested that expertise also be considered to ensure that the BOSC does not develop any gaps in its knowledge base. Dr. Denson agreed, and commented that the *Ad Hoc* Subcommittees provide a mechanism to mentor under-represented minorities so that they will eventually have the experience and knowledge needed to serve as a member of the BOSC. Dr. Denson noted that several American Indians attended a recent SAB meeting; he suggested that Dr. Small pursue potential Native American candidates. Dr. Preuss indicated that EPA may be able to provide names as well.

Dr. Denson recessed the meeting for the day.

Tuesday, February 9, 1999

Dr. Denson called the meeting to order at 9:00 a.m. He also informed the BOSC that, to meet scheduling constraints of several BOSC members, the order of business would be modified slightly. Discussion of future meeting dates will be held at 1:00 p.m., and the meeting will be adjourned at 3:45 p.m.

Particulate Matter Research Program: ORD Charge

Dr. Preuss introduced Dr. William Farland (EPA/NCEA), who is the senior executive in charge of EPA's Particulate Matter (PM) Program, and Dr. John Vandenberg (EPA/NHEERL), who is the Program Manager for the PM Program. EPA recently created the position of PM Program Manager to ensure that the PM Research Program forms a cohesive and comprehensive research program. However, the PM Program Manager does not have line authority over the scientists performing the research, which could be problematic.

A report prepared by the National Academy of Sciences (NAS) entitled, "Research Priorities for Airborne Particulate Matter: I. Immediate Priorities and a Long-Range Research Portfolio," identifies research priorities for PM—Dr. Denson reminded the Executive Committee that this report was provided to the BOSC members. Dr. Vandenberg indicated that EPA developed its PM Program to be complementary to the existing efforts and is interested in strong communication and integration with the other programs.

Dr. Vandenberg thanked the Executive Committee for their involvement in reviewing the PM Program. He quickly provided a recap of the briefing presented at the August BOSC Executive Committee Meeting. Dr. Vandenberg displayed diagrams of the PM Research Planning Process and the EPA PM Research Planning Structure (see Exhibit 2). He noted that the planning structure is unchanged from that provided in August except that he has been added to the management hierarchy as the Program Manager. Dr. Vandenberg indicated that the high-priority research needs, as identified by the National Research Council (NRC) include:

- Outdoor versus actual human exposure
- Exposure to toxic PM components
- Source-receptor tools
- Assessment of hazardous PM components
- Dosimetry
- Effects of PM and copollutants
- Susceptible subpopulations
- Biological mechanisms
- Analysis and measurement methods.

Dr. Vandenberg pointed out that the "source-receptor tools" priority was cleaved into two research areas by NRC—source-receptor tools development and source-receptor tools application. A followup report, which adjusts these priorities, is expected from NAS. A partial summary of program emphases regarding EPA PM research efforts was provided by Dr. Vandenberg:

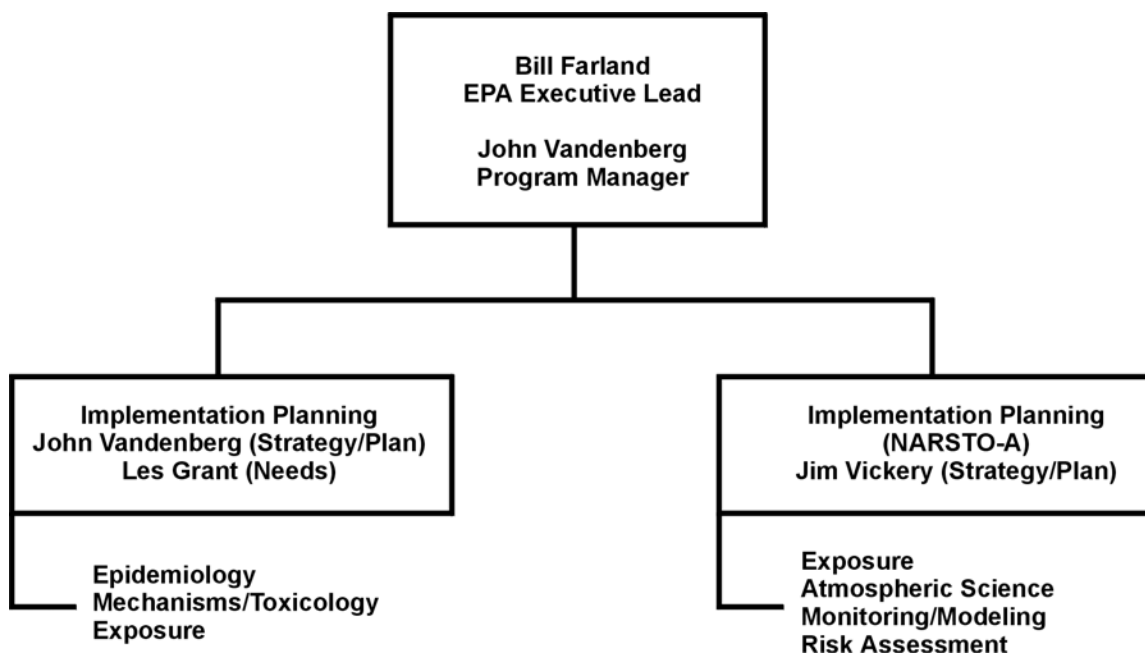
- Mechanisms of toxicity
- Susceptibility models
- Dosimetry of fine particles
- Epidemiology methods
- Human exposure analysis
- Environmental characterization and methods
- Atmospheric chemistry and modeling
- Emissions/source characterization.

Dr. Vandenberg provided a brief summary of other federal PM research efforts:

National Institute of Environmental Health Sciences (NIEHS)

- New epidemiology study ("Five-Cities") study
- Mechanism studies

Exhibit 2. EPA PM Research Planning Structure



National Institute of Allergy and Infectious Diseases (NIAID)

- Inner-city Asthma Study (with NIEHS and EPA)
- Prospective cohort study of asthma in newborns (with NIEHS)

National Institute for Occupational Safety and Health (NIOSH)/Centers for Disease Control and Prevention (CDC)

- Occupational asthma and PM
- Lung injury mechanisms for dusts

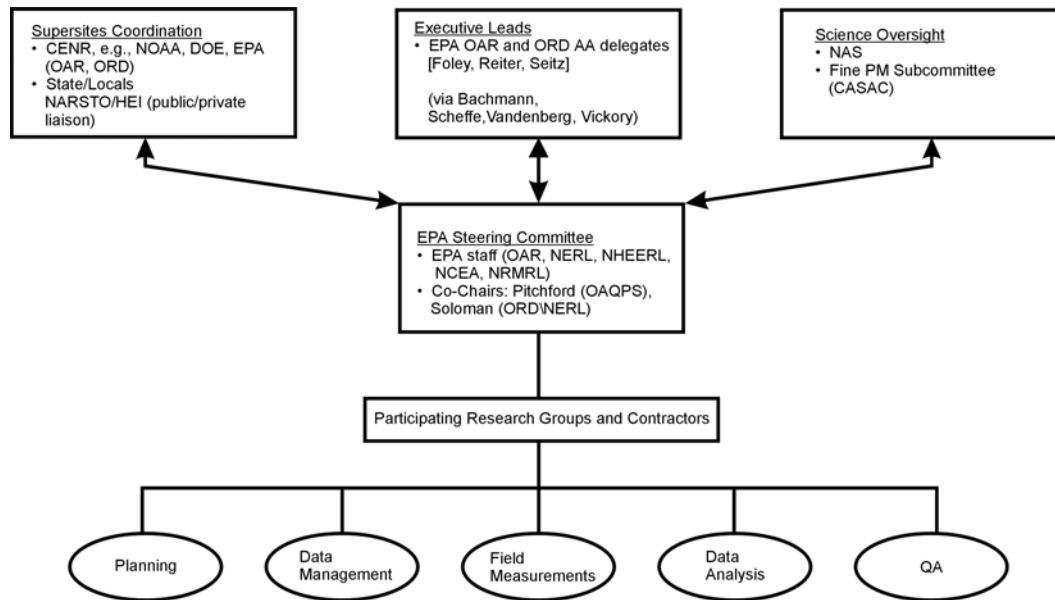
North American Research Strategy on Tropospheric Ozone (NARSTO); includes DOE, NOAA, EPRI, CRC, Canada, Mexico, and 60 Others)

- Observations and methods
- Chemistry and modeling
- Emissions
- Analysis and assessment.

Dr. Vandenberg indicated that a PM research strategy has been developed to provide direction for the next 5 years and to ensure that EPA scientists understand the benefits of the PM Program. The research strategy is intended to define the program vision, goals, and guiding principles as well as to strengthen research collaborations. As noted, a number of organizations will perform PM research. EPA will work with many of them, including NIAID, NIEHS, Department of Transportation (DOT), DOE, National Institute of Science and Technology (NIST), NARSTO, Health Effects Institute, Lovelace National Environmental Research Center, National Research Center for Statistics and the Environment, and the Mickey Leland National Urban Air Toxics Research Center.

Dr. Vandenberg provided an organization chart of the monitoring/research interface (see Exhibit 3), and noted that the executive leads are Dr. Gary Foley (EPA/NERL) and Dr. Lawrence Reiter (Science Advisor/ORD).

Exhibit 3. Organizational Chart of the Monitoring/Research Interface



Dr. Vandenberg believed that there is good internal and external coordination. He noted

that NAS will help with science oversight to help determine the direction of EPA’s PM Program. Dr. Vandenberg indicated that oversight among the federal organizations will be provided by the National Science and Technology Council’s Committee on Environment and Natural Resources (NSTC/CENR).

In response to Dr. Cooper’s question, Dr. Vandenberg indicated that the majority of EPA’s research focuses on outdoor air. Dr. Schnoor noted that the NAS focuses on total exposure—both indoor and outdoor. He commented that the STAR Program represented one of the few vehicles to do research for measuring indoor air exposure, yet funding for such activities was eliminated from the ORD FY2000 budget. Dr. Vandenberg responded that funding is not allocated for indoor air exposure research as a specific line item, but it has not been abandoned. It has been integrated into other programs. For example, the Children’s Asthma Research Program includes research that was formerly part of the indoor air research. Dr. Cooper expressed concern that there may be a disconnect between outdoor monitoring and indoor risk. Dr. Vandenberg assured Dr. Cooper that EPA/NERL is considering indoor air exposure issues. Dr. Loehr suggested that the BOSC provide comments regarding EPA’s approach to outdoor and indoor air research. Dr. Preuss responded that a significant amount of indoor air research is planned; he offered to detail the efforts for the BOSC.

Dr. Denson noted that the August Meeting Summary (page 7, line 3), states, “Mr. Longest would like the BOSC to focus on the implementation of the PM research program.” Within the PM Charge, it states, “Overarching research prioritization and program implementation are management aspects anticipated to be addressed by the NAS and the Clean Air Scientific Advisory Committee (CASAC), while for the BOSC, the focus should be on cross-Laboratory/Center prioritization and program implementation.” Dr. Denson requested clarification regarding the definition of “implementation.” Dr. Farland reminded the BOSC that the PM Program is multifaceted and, as suggested by the charge, implementation of the overall PM research program will be overseen by NAS and, to a lesser extent, CASAC. He suggested that BOSC should concentrate on EPA’s implementation of its PM research efforts. Dr. Cooper asked if the ORD effort will be self sufficient or if certain components depend on other agencies. Dr. Farland responded that ORD has defined a niche for its research efforts; however, ORD’s effort should be considered with respect to the other efforts to achieve a better perspective on the research. Dr. Vandenberg indicated that EPA’s primary role will be within the health and human effects arena. In addition, effort also will be expended in atmospheric sciences. Dr. Vandenberg indicated that ORD is more interested in a review of EPA management

implementation; NAS will perform an overarching program implementation review (i.e., are the correct organizations performing the correct science). Dr. Preuss indicated that Mr. Henry Longest II (former acting AA/ORD) was concerned that EPA would not implement a highly integrated PM research program. He wanted the BOSC to look at the day-to-day implementation of the program, for example, are the scientists interacting with peers, etc., to get the right science done. Dr. Cooper responded that the expertise of BOSC lies in its ability to evaluate science. He suggested that integration is best determined by examining how scientists are interacting with one another; NAS and CASAC are not responsible for these aspects of the review.

Dr. Preuss indicated that a rigorous peer review of the Supersites would be useful to determine if good science is being performed and if data are integrated into the overall PM program, which was a concern of NAS. Dr. Small suggested that the BOSC could determine if there are reviewable issues, for example, is there adequate consideration of how the multifaceted program retains cohesion. Dr. Farland suggested that the BOSC determine if ORD has, in expanding the PM Program, moved into the new areas identified by the NAS. Dr. Small noted that information regarding past spending would be needed to accomplish this task.

Dr. Loehr believes that the BOSC functions better when it reacts to information rather than generating it on its own. He suggested that the charge, as prepared, is well crafted, but the BOSC will need documentation to carry out the charge. The documentation should identify EPA's primary and secondary responsibilities, and describe EPA's role relative to other programs. Dr. Vandenberg indicated that the PM Program is better integrated than many other EPA programs, and he agreed to provide the necessary documentation to assist the BOSC in its review. However, he indicated that the role of EPA with respect to other organizations is a work in progress and, therefore, EPA may not be able to definitively demarcate that role. Dr. Farland added that briefing packages presented to the NAS and materials used for developing the research strategy could be made available to the BOSC. Dr. Loehr suggested that the BOSC identify a number of self-study questions for response by EPA. Dr. Denson concurred and proposed a format similar to that for the Laboratory/Center Reviews—the BOSC will develop a series of questions to which EPA will respond, the BOSC will perform a site review, and then prepare a report. As noted, the PM Program has expanded considerably in a short time period—Dr. Brown asked Dr. Farland if it would be useful for the BOSC to consider human resource allocations. In response, Dr. Farland indicated that the BOSC's input on that issue would be useful. Dr. Preuss agreed and commented that EPA needs additional expertise in exposure areas.

Dr. Thomas Burke (Johns Hopkins University) did not think that the BOSC was qualified to address purely management issues, but rather more suited to determine if the right management for the science exists. For example, is the infrastructure for science being supported adequately? Dr. Farland responded that advice is needed to ensure that ORD is implementing the program appropriately. Dr. Preuss agreed, and pointed out that this is an important distinction. The BOSC should not focus on management consultation, but on science and infrastructure. He noted that ORD is proud of the PM Program, but would like to improve it.

Dr. Bus noted that the PM Program Review is inherently different than the Laboratories/Centers Reviews in that this program is highly integrated with organizations external to ORD. He asked if the BOSC members would be able to contact the external organizations—the BOSC agreed that interaction with the external organizations would be necessary for a successful programmatic review.

Dr. Vandenberg indicated that the total PM research effort is approximately \$100M and EPA is the largest player. In response to Dr. Cooper's question, Dr. Vandenberg stated that approximately 45 percent of the ORD FY99 PM budget (~\$20.4M of \$46M) was dedicated to internal EPA activities. He explained that the base ORD FY99 PM budget was \$26M, of which \$7-8M was allocated to external grants. The remainder of the \$46M (\$20M) was for Congressional earmarks, \$17.6M of which was dedicated to external activities. Dr. Preuss indicated that NARSTO plans to implement a \$50M PM Program. In a major review of the current state of tropospheric ozone science in 1991, the NAS recommended a nationally coordinated program of research to improve the progress and productivity of tropospheric ozone science. Not long after that, a public-private sector partnership, known as NARSTO was formed to address the major scientific uncertainties identified by the NAS. There are over 70 participating members in NARSTO, with EPA providing significant

leadership in the program. Dr. Preuss also mentioned the Health Effects Institute (HEI), which will fund PM research (primarily through RFAs). HEI is a public-private partnership originally established to research and provide impartial information about the health effects of emissions from motor vehicles and other sources of environmental pollution. HEI receives half of its core funds from the EPA and half from 28 manufacturers or marketers of motor vehicles or engines in the United States.

Dr. Denson stated that he is unable to identify the specific tasks that will comprise the PM review. Dr. Cooper suggested that the PM Program Review could be performed in conjunction with a followup visit to the Laboratories/Centers. Dr. Brown suggested that the BOSC determine the Laboratory/Center involvement with respect to the EPA PM research priorities, and address how they are implementing them. Dr. Bus reminded the BOSC that the PM Program is quite broad, and suggested that the BOSC address critical timelines, determine if they are appropriate, and if EPA will be able to meet them. He also reminded the BOSC members that Dr. Vandenberg has no line authority, which he believes will make it difficult to meet critical deadlines. The PM standard will be reassessed in 2002 to ensure that it is protective of human health—Dr. Farland suggested that the BOSC provide oversight to EPA on this issue.

Based on the discussion, Dr. Denson identified the following elements to be considered during the BOSC review of the PM Program:

- Schedule/timeline
- NAS priorities
- Functional relationships
- Partnerships/commitments
- Redundancy/uncertainty
- Grants program
- Key methods used by partners
- Translation of results.

Dr. Burke expressed his belief that communication of science is the ultimate measure of success. Dr. Bus agreed, and suggested that a communication plan be developed. Dr. Farland replied that a communication strategy will be developed by ORD and EPA's Office of Air and Radiation (OAR).

Dr. Denson indicated that the BOSC probably will interview Dr. Vandenberg, Dr. Farland, staff scientists, and other partners as part of the PM Program Review. Dr. Vandenberg informed the BOSC that an international colloquium will be held in Durham, NC, on June 6-9, 1999. A number of the prominent contributors to the PM effort will be at that meeting. He suggested that the BOSC attend, which would provide an opportunity to view current PM research and to discuss that research with the investigators. Dr. Preuss indicated that a relevancy review of EPA's PM Centers will be performed later this month—he indicated that the reports should be available by early April. Dr. Small expressed interest in these reports.

Upcoming BOSC Meetings

The next two BOSC meetings were scheduled for May 3-4, 1999, and August 23-24, 1999, at a location to be determined. Dr. Denson added that teleconferences will be necessary prior to the next BOSC meeting. Dr. Cooper indicated that he will not be able to attend the May 3-4, 1999 BOSC Meeting. Dr. Loehr mentioned that he may not be able to attend the August 23-24, 1999, BOSC Meeting.

BOSC Charge for the SAB/BOSC STAR Program Review

Dr. Brown and Dr. Cooper provided the BOSC with a draft BOSC charge for the joint SAB/BOSC STAR Program Review. Dr. Cooper indicated that the charge was developed in consideration of yesterday's discussion, and focuses on the uniqueness of the creative endeavors that the STAR Program contributes to the innovative science needed to address emerging environmental problems. The BOSC is charged with determining the value added to EPA through implementation of the STAR Program. Dr. Bus noted that the National Institute for the Environment (NIE), a grant-funding institution, supports goals similar to those of the STAR Program. He thought the NIE had suggested that the STAR Program is not considering emerging and future issues adequately. Dr. Loehr indicated that it is premature to perform a detailed evaluation of the

STAR Program—he believes that the SAB/BOSC review may be helpful for EPA in developing a plan of evaluation. Dr. Brown suggested that a plan for evaluating the STAR Program be developed, for example, the BOSC could define metrics, both relating to short- and long-term goals, so that EPA can put a process in place to be able to measure those metrics. Dr. Denson noted that the Executive Committee appears to have consensus regarding long-term measurements of success (i.e., peer-reviewed publications), but short-term goals have not been identified. He stressed the importance of distinguishing between short- and long-term goals.

Dr. Denson agreed to inform the SAB that he has been charged by the BOSC to serve on a joint SAB/BOSC review of the STAR Program. Dr. Cooper was unclear if the SAB intended to perform the review, or if the SAB was merely considering it. Dr. Denson agreed to contact Dr. Barnes for clarification, but also noted that a review of the STAR Program will occur in the future, and it is appropriate for the BOSC to be involved. Dr. Preuss has been asked to attend the next RSAC Meeting to discuss a review of the STAR Program—he agreed with Dr. Denson, that the review will occur in the near future. Dr. Loehr agreed that there is value in providing assistance to the SAB to develop a plan for evaluating the STAR Program. He added that, based on the discussion, it would be premature to enter into a highly detailed review at this time. Dr. Denson mentioned that the relationship between the STAR Program and the EPA Program Offices should be acknowledged. Dr. Preuss indicated that it would be helpful to know if the STAR Program is meeting its expectations, and if those expectations are valid. Dr. Denson agreed to provide a copy of the charge to the SAB. Dr. Brown indicated that she will edit the BOSC charge for its role in the SAB/BOSC review of the STAR Program, and will provide to Dr. Denson by the end of the meeting (see Attachment 1).

Because several BOSC members had referred to the Adopt-A-Grant Program, Dr. Preuss informed the BOSC that the program has been discontinued. He indicated that the Adopt-A-Grant Program was too unwieldy in terms of information transfer. Instead, a searchable Web server will be implemented to serve the same function. Dr. Burke indicated that the STAR Program provides important infrastructure for environmental research. Dr. Cooper expressed concern about the difficulties of transitioning former grant managers to researchers. Dr. Preuss indicated that this issue has been considered, but no clear solution has been identified.

Particulate Matter Research Program: ORD Charge (Continued)

Dr. Denson noted that when he and Dr. Huggett discussed undertaking the programmatic review of the Laboratories/Centers, a template was identified that worked well. A variety of resources also were made available to the Board to assist the BOSC in preparation of the reports, such as the help of the Designated Federal Official, a technical contact, and a support contractor. Dr. Preuss indicated that ORD will provide the support that the BOSC needs to perform the PM Program Review. He noted that Dr. Vandenberg would be a good technical point of contact because he meets with a number of PM experts on a regular basis. Dr. Farland agreed, and commented that the technical liaisons referenced by Dr. Preuss would be a good starting point to identify issues. The technical role referenced by Dr. Denson was more of a disinterested party compared to the technical liaisons referenced by Dr. Farland. Although such technical assistance may be useful, Dr. Cooper thought the *Ad Hoc* Subcommittee members should write the reports. Dr. Denson indicated that authorship was a prerogative of the *Ad Hoc* Subcommittee Chair. Dr. Bus believed that Mr. Ed Bender (EPA), who served as a technical contact for a previous BOSC review, was a valuable resource to the BOSC as he explained how EPA worked and interacted. Although he did not author the report, he played an important role in outlining elements to ensure that the BOSC did not overlook any particular aspect. Dr. Denson indicated that contractor support would be helpful, and agreed to transmit the BOSC needs to the AA/ORD in writing.

Dr. Bus suggested that the BOSC generate a series of questions for the Laboratories/Centers or Dr. Vandenberg to answer in connection with the PM Program. Dr. Schnoor asked Dr. Vandenberg if he could identify persons from the Laboratories/Centers to respond to these questions. Dr. Vandenberg replied that he could identify individuals and added that the research efforts align fairly well with the Laboratories/Centers.

Dr. Brown suggested that the organizational framework of the PM Program Review be centered on the NAS research priorities rather than the Laboratories/Centers. Dr. Denson asked if the same self-study questions could be asked of all research priorities. Dr. Cooper suggested that the questions be relatively open ended to allow flexibility in the responses. Dr. Brown suggested that the BOSC minimize its initial information requirements. She asked if some of the research priorities could be aggregated together. Dr. Schnoor suggested that the 10 research priorities be reduced to five so that two BOSC members could be assigned to consider each research priority. Dr. Loehr asked how the BOSC should go about interviewing a “research effort.” Dr. Preuss indicated that one or two Laboratories/Centers are associated with any one research priority. Dr. Small suggested that a Web page be established that cross-references the Laboratories/Centers with the research topics in which they are involved. The Web site should provide complete details, including the number of projects, specific projects, principal investigators, products (papers, reports), intramural research, extramural research, etc. He indicated that it would enable the BOSC and others to understand the areas in which each Laboratory/Center is involved. Dr. Small suggested that it be established by the next BOSC meeting so that the Board could review it online. Dr. Denson asked if that was the best way to organize the information—Dr. Small thought that it was as it lends itself to the formation of *Ad Hoc* Subcommittees to focus on specific research topics.

Dr. Loehr noted that there are six main points to the BOSC charge on the PM Program Review. He suggested that these be used as the basis for self-study questions. Dr. Denson agreed with this suggestion.

Based on the discussion, Dr. Denson suggested that the BOSC:

- Rewrite the questions in the charge into self-study questions.
- Demonstrate that the NAS priorities are being met.

Dr. Cooper indicated that it is important to converse with scientists to ensure that science is conveyed up the management hierarchy. Dr. Denson agreed that BOSC members should interview both the Laboratory/Center Director and the research team. Dr. Denson commented that the previous reviews were successful, in part, because the BOSC spoke with numerous people: Center Directors, scientists, Branch Chiefs, etc. Dr. Loehr indicated that this approach seems reasonable for the PM Program Review as well. Dr. Bus agreed, but reminded the BOSC that there are appreciable differences from the other programmatic reviews. For example, a timeline has been mandated and the BOSC must determine if ORD is on track to meet that timeline.

The BOSC agreed that *Ad Hoc* Subcommittees should be established in accordance with the research priorities. Dr. Small suggested that three to four *Ad Hoc* Subcommittees be established to address the research efforts; an additional *Ad Hoc* Subcommittee could be established to consider integration. Dr. Denson was hesitant to assign more than two research efforts to a Subcommittee. Dr. Cooper suggested that each of five *Ad hoc* Subcommittees be responsible for two research topics as well as integration aspects—it would be interesting to compare the results of the different *Ad Hoc* Subcommittee reviews regarding integration. Dr. Burke suggested that the overarching conclusions of the review be completed by the Executive Committee.

In response to Dr. Denson’s question, Dr. Vandenberg provided the following relation between the research efforts and the Laboratories/Centers:

1. Outdoor versus actual human exposure—NERL, NHEERL
2. Exposure to toxic PM components—NERL, NHEERL
3. Source-receptor tools: development—NERL
4. Source-receptor tools: application—NERL
5. Assessment of hazardous PM components—NHEERL
6. Dosimetry—NHEERL
7. Effects of PM and copollutants—NHEERL

8. Susceptible subpopulations—NHEERL
9. Biological mechanisms—NHEERL
10. Analysis and measurement methods—NCEA

Dr. Preuss indicated that NCERQA is involved in each of these research topics. Dr. Denson suggested that the BOSC address the 10 research issues through five *Ad Hoc* Subcommittees; a sixth *Ad Hoc* Subcommittee will be formed to address coordination and integration. The following *Ad Hoc* Subcommittees were formed:

- *Exposure Subcommittee*: Research priorities 1 and 2
- *Atmospheric Subcommittee*: Research priorities 3 and 4
- *Epidemiology Subcommittee*: Research priorities 7 and 8
- *Toxicology Subcommittee*: Research priorities 5, 6, and 9
- *Assessment Subcommittee*: Research priority 10.

Dr. Vandenberg suggested that a sixth *Ad Hoc* Subcommittee (Risk Management Subcommittee) be formed to address emissions control and source control. He indicated that NRMRL is the primary EPA laboratory involved in that effort. Dr. Schnoor and Dr. Cooper agreed to prepare self-study questions regarding the PM Program Review. Dr. Cooper will transmit the questions to Dr. Denson, who will circulate them to the BOSC members for review and comment. Members agreed to provide preferences regarding *Ad Hoc* Subcommittee assignments to Dr. Denson. *Ad Hoc* Subcommittee rosters will be developed by Dr. Denson and circulated to the BOSC.

In response to Dr. Loehr's question, Dr. Vandenberg indicated that the Laboratories/Centers could respond to self-study questions 6 weeks after receipt. Dr. Burke commented that these reviews are very interrelated. Dr. Schnoor noted that the Subcommittees will need to work together. Dr. Burke suggested that background information be provided before the visits to the Laboratories/Centers. Dr. Vandenberg replied that there is substantial background information that can be provided to the Subcommittees. Dr. Burke indicated that such information would be useful; he suggested that a presentation also might be helpful to allow Subcommittee members to ask questions. Dr. Preuss agreed that background information is needed by the BOSC; he suggested that the BOSC hold a meeting at EPA's Research Triangle Park (RTP) facility to acquire much of that information. This would enable the BOSC to talk directly to EPA personnel and visit the RTP Facility. He reminded the BOSC of the June 6-9 colloquium in Durham, NC, and suggested that the RTP visit be coordinated with the colloquium. Dr. Noonan agreed that a trip to EPA/RTP would be beneficial. Dr. Small agreed and suggested that background information be provided beforehand so that the BOSC members could begin to develop questions. Dr. Cooper noted that the BOSC members do not need to become experts on PM, rather they need to be able to understand what the Laboratories/Centers are trying to communicate.

Dr. Denson noted that a draft report needs to be prepared by September 1999. He stated that if the BOSC meets in RTP, NC, on May 3-4, 1999, information must be provided to members before then. He added that the Subcommittees need to be established and invited to attend the RTP meeting. Dr. Denson indicated that a conference call will be scheduled in the near future to move forward on these issues.

Dr. Bus indicated that it would be useful for the Laboratories/Centers to identify the potential bottlenecks within the timeline; the Laboratories/Centers also should indicate how each perceives itself in the research portfolio. Dr. Preuss indicated that a matrix of all PM outputs is under development. Hopefully, this will be available before the May meeting. Dr. Bus indicated that such a matrix would be helpful.

Dr. Denson informed Dr. Noonan that the BOSC would like to pattern the PM Program Review after the Laboratory/Center reviews. To do so, the BOSC will need support from ORD—Dr. Noonan indicated that ORD will provide the necessary resources to the BOSC so that it may complete its charge.

In response to Dr. Noonan's question, Dr. Small indicated that two lists of candidate names have been developed—candidate members for the BOSC Executive Committee and candidate members for *Ad Hoc*

Subcommittees. Dr. Noonan suggested that the National Action Council for Minorities in Engineering (NACME) be consulted regarding potential candidates.

Dr. Cooper asked about EPA's plans to address biopollution. He noted that more children die of water-borne pathogens than anything else. Dr. Noonan indicated that the Committee on Environment and Natural Resources will consider this issue. Dr. Preuss added that an RFA was prepared on this issue, but very few submissions were received.

Ms. Hamilton reminded BOSC members to submit Form SF450: Confidential Financial Disclosure Form if they had not done so. Dr. Denson asked for public comment—there was none. The meeting was adjourned at 3:45 p.m.

Action Items

- Ms. Hamilton will circulate resumes for Dr. McCay and Dr. Bostrum.
- Ms. Hamilton will investigate e-mail notification of BOSC members following direct deposit payments by EPA.
- Dr. Denson will send a letter to the *Ad Hoc* Subcommittee members who participated in the Laboratory/Center programmatic reviews thanking them for their involvement.
- Dr. Denson will prepare a transmittal letter to the Assistant Administrator, ORD (AA/ORD), regarding the Laboratory/Center programmatic reviews, to be signed by Dr. Denson, as Executive Committee Chair, and each *Ad Hoc* Subcommittee Chair.
- Each *Ad Hoc* Subcommittee Chair will sign the transmittal letter and the last Chair to sign will forward the letter to Ms. Hamilton, who will deliver the letter to the AA/ORD.
- Ms. Hamilton will determine how the SAB maintains a group of consultants.
- BOSC members will provide information on prospective Executive Committee members and prospective Subcommittee members to Dr. Small.
- Dr. Small will compile resumes for prospective Executive Committee members and Subcommittee members.
- Dr. Preuss, Dr. Cooper, and Dr. Brown will develop a draft BOSC charge regarding the possible joint SAB/BOSC review of the STAR Program for consideration by the BOSC.
- Dr. Denson will verify that the SAB intends to perform a joint SAB/BOSC review of the STAR Program.
- Dr. Denson will transmit the BOSC charge regarding the possible joint SAB/BOSC review of the STAR Program to the SAB.
- BOSC members will complete Form SF450 (Confidential Financial Disclosure Form) and send it to Ms. Hamilton, if they have not already done so.
- Dr. Denson will discuss with the AA/ORD the list of materials and information needed by the BOSC to perform the PM Program Review.
- Dr. Schnoor and Dr. Cooper will prepare self-study questions regarding the PM review to be Program provided to the Laboratories/Centers. Dr. Cooper will transmit the questions to Dr. Denson.
- Dr. Denson will circulate the self-study questions to the BOSC for review and comment.
- EPA will respond to the self-study questions within 6 weeks of receipt.
- BOSC members will provide preferences regarding *Ad Hoc* Subcommittee assignments to Dr. Denson.
- Dr. Denson will identify *Ad Hoc* Subcommittee rosters, and will circulate the rosters to the BOSC.
- The next BOSC meeting will be held May 3-4, 1999, at a location to be determined.

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Attachment 1

BOSC Charge for the SAB/BOSC Review of the STAR Program February 9, 1999

Focus: The uniqueness of the creative endeavors that the STAR Program will contribute to the innovative science needed to address emerging environmental problems.

Process: Assume that the STAR Program will foster the same type of high quality research that one finds with the peer review grants programs in NSF and NIH. Identify the total R&D program within EPA. As a further baseline, identify the environmental research programs in other federal agencies that focus on the EPA priority areas (PM, global change, etc.). Then evaluate the value added of the STAR Program to the mission and credibility of EPA.

Steps: Develop a plan for evaluating the STAR Program, which focuses on management and process issues in the initial phase and on impacts and accomplishments in the later phase.

Management and process issues might include:

- The outreach process and the resulting number and nature of proposals (e.g., topics covered, innovativeness).
- The selection process, including the quality and number of peer reviews.
- Oversight, guidance, and assistance provided during the grant period.
- Process of feeding results back to the DOE/ORD program offices.

Impacts and accomplishments to be evaluated (in the long run) might include:

- Peer-reviewed publications.
- Support of the national environmental science infrastructure (e.g., scientific training, career development).
- Contributions to EPA's regulatory process (i.e., relevance and responsiveness to the EPA/ORD Program Offices).
- Citations to the publications resulting from the STAR Program.

In addition to identifying appropriate metrics, the plan will identify the mechanisms and methods for collecting information to quantify these metrics (e.g., surveying of grantees, citation indices, etc.).

Attachment 2

Particulate Matter Research Program: ORD Charge