



National Advisory Council for Environmental Policy and Technology

January 28, 2008

Administrator Stephen L. Johnson
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

***Re: NACEPT Comments on EPA's 2007 Report on the Environment:
Highlights of National Trends***

Dear Administrator Johnson:

On behalf of the National Advisory Council for Environmental Policy and Technology, I am pleased to forward to you the Council's comments on EPA's draft 2007 Report on the Environment: Highlights of National Trends (ROE/HD).

The Council commends EPA for preparing the Report and working to improve it. Better understanding of our nation's environmental conditions and effectively communicating that information to the public is essential to making sound policy and fostering the environmental stewardship necessary to implement it. NACEPT strongly encourages the agency to continue this work.

The Council concludes that the Highlights Document accurately represents the scientific content of the Report on the Environment's Science Report. However, we have several concerns, and offer recommendations to address those concerns, regarding the agency's ability to chart environmental changes and to report and track trends.

In the attached comments, the Council suggests ways to strengthen the Report, including:

- Maintain the integrity of the Report. The Report should be as independent as possible of EPA regulatory activities, and it should not be used as a public relations tool to highlight favorable results or obscure problems.
- Select scientifically valid indicators that address the most important environmental issues, describe in the Report the cause-and-effect relationships to inform those indicators, and maintain the same set of indicators across Reports to allow meaningful

evaluation by the agency and the public. New issues will necessitate the addition of new indicators but should not detract from the continuity of the historical indicators.

- Highlight regional examples of environmental conditions and trends and provide available regional data.
- Draw some conclusions from the data presented (within each chapter and at the Report's end) to give the agency and the public some sense of whether conditions are getting better, worse, or staying the same.
- Provide information (or links) for how individuals can be better stewards in addressing problems the Report identifies.
- Ensure on-line access to and more frequent updates of the Report's data and trends, and inform hard-copy readers about the electronic version and the opportunities to drill down to other levels of data.

We also are attaching public comments we received regarding several groups' request that EPA address light pollution. We appreciate you giving us the opportunity to comment on this critical document, and we stand ready to provide any additional input or answer any questions about our comments.

Sincerely,

/Signed/

John L. Howard, Jr.
Chair

cc: Arleen O'Donnell, Working Group Co-Chair
Dan Watts, Working Group Co-Chair
Marcus Peacock, Deputy Administrator
Charles Ingebretson, Chief of Staff
Ray Spears, Deputy Chief of Staff
Molly O'Neill, Assistant Administrator for Environmental Information and Chief
Information Officer
Mike Flynn, Director, Office of Information Analysis and Access, OEI
Vanessa Vu, Director, Science Advisory Board
Rafael DeLeon, Director, Office of Cooperative Environmental Management
Sonia Altieri, NACEPT Designated Federal Officer



**National Advisory Council for
Environmental Policy and Technology Comments on
EPA's 2007 Report on the Environment: Highlights of National Trends**

January 26, 2008

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I. INTRODUCTION

Responding to a charge from EPA to conduct a peer review of *EPA's 2007 Report on the Environment: Highlights of National Trends*, NACEPT established a workgroup to review the Highlights Document critically, to respond to the particular questions in the Charge, to suggest changes that could help the document achieve its objectives, and to provide a series of editorial comments designed to improve the clarity of the presentation. In addition, the workgroup has proposed some changes in the overall process in order to enhance the effectiveness of future EPA Reports on the Environment.

NACEPT was asked to answer three questions,

- 1. Does the Highlights Document accurately represent the scientific content of the Technical Document? Are key areas over- or under-represented? Would someone familiar with both documents come to the same conclusions regarding human health and the state of the nation's environment?*
- 2. The Highlights Document distills the information found in the Technical Document. Is the Highlights Document scientifically accurate? What conclusions would one come to regarding human health and the state of the nation's environment?*
- 3. Is the information in the Highlights Document presented in a way that is understandable to the target audience? Are the structure and length of the Highlights Document appropriate for its content and the target audience? How could the presentation be improved?*

In response to the first question in the charge, NACEPT concludes that the Highlights Document accurately represents the scientific content of the Technical Document (also known as the Science Report). Key areas seem equally represented in both documents, recognizing the relative brevity of the Highlights document. Someone familiar with both documents would likely draw the same conclusions from reading the text of each.

However, NACEPT also notes, reflecting a series of draft comments that have emerged from the parallel review of the full Report by the EPA Science Advisory Board, that there are shortcomings in the full Report with regard to the ability to chart environmental changes and to report and track trends. This is especially evident in the Chapters on Land, Human Health, and Ecosystems, but prevails throughout the Report. The effect in the Highlights Document, which must reflect in a briefer format the full Report, is to give the appearance either that no significant changes are taking place in the United States or that EPA is unaware of them, neither of which is true.

In response to the second question in the charge, NACEPT concludes that the Highlights Document accurately portrays the Technical Document's scientific content. However, the Highlights Document does not successfully communicate the ecological connectivity among the various chapters. Due to the absence of such connections, a reader is likely to

conclude that there are changes in human health and in the state of the nation's environment, but be unable to ascertain trends or cause and effect relationships.

In response to the third question, the information in the Highlights Document is presented in a way that should be understandable to the target audience. The structure and length are appropriate. Some features such as the use of color and the graphs are particularly effective. NACEPT does have suggestions to improve the ability of the Highlights Document to meet its goal to “inform the audience about important environmental issues, make the information meaningful to them, and provide a means for the audience to access more in-depth information.”

For example, the information presented needs to draw some conclusions rather than leaving the audience to ask “So what?” Even given the absence of trend data, EPA should be able to comment on what it does know.

The information presented should be as relevant to the reader as possible. For example, the public is likely to be interested in how their region or locale is faring compared to the rest of the country. Links to more local data may help them answer this question and spur further questions or beneficial action. In addition, some issues of current widespread interest such as autism and obesity are not discussed and their absence is noticeable.

Several of the improvements suggested above are intended to take greater advantage of electronic tools, especially links, and the wide availability of on-line data. The Highlights Document itself should provide more explanation about how to find links and access data. That implies also that careful attention must be given to the imminent design and launch of the web-based Report in order to help achieve these goals.

The audience should be empowered to do something to help improve the environmental trends or conditions. EPA is losing a wonderful opportunity if it does not include some basic information in each section about environmental stewardship by each citizen. A link to an appropriate section of the EPA website might be a start in achieving this type of benefit.

II. OVERARCHING RECOMMENDATIONS

The Report on the Environment (ROE) Highlights Document (HD) needs to be strengthened in four very important ways:

1. **CONCLUSIONS**: The information presented needs to lead to some conclusions. The document contains few insights into the relationship between cause and effect. The report would benefit from conclusions at the end of each chapter and at the end of the document. Absent interpretation, even the well informed public will have little clue as to what the information is really saying about the condition of the environment, and whether it's getting better, worse, or staying the same. Absent conclusions, the Highlights Document leaves the impression that no significant changes are taking place in the nation, or that EPA is unaware of them. It is frustrating for the taxpaying public to read again and again that data are unavailable or inadequate. EPA needs to take a stronger stand in this ROE, including postulating about causal relationships, trends, and reporting more about what it does know, rather than dwelling so much on what it does not know.
2. **EMPOWERMENT**: There needs to be more on what the reader can do. A primary purpose for issuing the Highlights Document is to provide a more general, less scientific public with information about the country's environmental conditions and trends. This audience (the "well informed public") is generally not scientists but policymakers, politicians, agency staff, environmental activists, teachers, and concerned citizens. They will want to know what they can do to protect the environment, given the problems we currently face. EPA would miss an important opportunity to further the cause of environmental stewardship if it did not provide at least some basic information in each section or at the end of the document about how all citizens can be better stewards. The Highlights Document also should recognize the many, many entities that work to address environmental issues (federal, tribal, state, local, private, NGO, etc.) that offer both additional scientific information and opportunities for stewardship. EPA should address this shortcoming of the report by developing links to appropriate sections of its web site to further inform the reader about what they can do to take action. A link to a stewardship page of EPA's website would be a start in the right direction.
3. **RELEVANCE**: Of necessity, the information presented in this report is generalized on a nationwide level. The informed public, however, will want to know how their region or locale is faring compared to the rest of the country. This can be satisfied by inserts in the text highlighting examples of environmental conditions from around the country, regardless of whether those conditions indicate improvements or further degradation. At the very least, the HD could have links for regional/local information. In addition, some current high-visibility issues were conspicuously absent from the document: autism, asthma, light pollution, and childhood obesity (although EPA would need to be very clear how environmental conditions are linked to childhood obesity). This report would

appear to be out of touch with the concerns of the general public if it didn't at least mention these issues.

4. GOING ELECTRONIC: The Highlights Document should explain a bit more about the electronic version and how it not only can (and will) be updated more frequently but can also be used to drill down from the national to regional and state and local levels of information (where they exist).

Finally, the Highlights Document could help the Agency make continued progress toward decisions leading to sustainability for the nation by using "Sustainability" as an overarching theme. NACEPT believes that theme is particularly relevant to the Land and Water Chapters and should be applicable to the entire report. A sustainability theme could be highlighted for each chapter (side bar or text box) and used to coalesce the entire report around an important message. It is recognized that major structural changes in the Highlights Document would be impractical for this edition of the report; however, NACEPT encourages this thematic approach as a key organizing element for the next version of the Report on the Environment. For this edition, EPA could reference its recent work on environmental stewardship that can be helpful in working towards sustainability.

III. POLICY BENEFITS AND IMPLICATIONS OF THE EPA REPORT ON THE ENVIRONMENT

Understanding the condition of the nation's environment and measuring changes in its status over time should be an essential component of a well-conceived and managed environmental protection system. The steps taken so far to develop, focus, and improve the EPA Report on the Environment are commendable. The 2007 version presents a higher standard than did the first version which provided an admirable foundation. Yet, there is more to be done. NACEPT strongly encourages the continuation of the ROE process. Two important reasons for this belief, among others, are that a regularly produced scientifically valid assessment of the environment of the country is an invaluable tool for assessing the performance of the Agency and for planning for the most effective use of resources in improving performance. Moreover, such an assessment provides an exceptionally powerful communication tool to convey to the American public both environmental successes and information about environmental areas where more work needs to be done.

That being said, NACEPT strongly urges that EPA keep some points in mind as the ROE initiative expands in the future.

- For maximum effectiveness, as a management tool and a communication medium, the ROE must not be seen, by the Agency or by the public, as a public relations document where favorable results are highlighted and areas of less progress are obscured. All areas must receive equal attention, both successes and challenges.

- The set of indicators must be stable, that is, the same indicators should appear each time the ROE appears in order to allow meaningful evaluation of progress. Certainly, during the current initial stages of the process some change can be expected and new issues will surface for the first time in future editions, but consistency should be achieved as much as possible and as soon as possible. In the future, changes may be desirable as conditions change and the technical ability to monitor environmental variables change, but modification of the set of indicators should be gradual and methodical in order to avoid the perception that the ROE process is being manipulated.
- As much as possible, the ROE process should be seen as separate from EPA regulatory and reporting activities, in part because data generated from other federal agencies are important components of the Report. While EPA planning should be informed by the trends identified in the ROE, EPA should avoid steps or actions that could result in a perception that the ROE process can be compromised to benefit the Agency. This means that the ROE preparation should be the direct responsibility of EPA offices not directly participating in regulation and enforcement. Perception, whether or not based on fact, can be an important factor in the long-term acceptance of the environmental data developed and presented.
- Because federal environmental priorities are most often established on a nationwide basis, a national assessment and national trends are critical for the ROE. NACEPT recognizes that is the direction that the ROE has taken and supports that decision. However, individual responses to the document, whether by industry or individuals, are more likely to focus on environmental conditions more local to any individual who is motivated to respond through change. Availability of regional data to an interested public must be seen as a critical part of the ROE process as it moves ahead. In this case, the concept of “regional” should be seen as different from EPA Regional borders; it should focus on ecological regions or watersheds or other pertinent environmental areas.
- Significant attention should continue to be given to selecting scientifically valid indicators and, whenever possible, describing cause-and-effect relationships. Yet, at the same time, there must be due consideration to the question of what aspects of the environment are most important and need to be measured and monitored. The nation would benefit from thoughtful reflection on the question of what we would like to possess in the future of our environment, and making certain that we have developed the capability to monitor its aspects. Perhaps the monitoring and data accumulation of today, even though scientifically valid, does not provide the complete set of information or the type of information that the nation would like to see. However, raising the question could be a significant benefit of the ROE process.

- On-line access and more regular update of environmental data bases and trend information may eventually have the greatest impact of any part of the entire ROE process. NACEPT strongly urges that the online version of the report be designed and evaluated to ensure easy access and search capabilities. Moreover, the electronic report should anticipate and encourage greater use by more sophisticated readers.

IV. COMMENTS ON SPECIFIC CHAPTERS OF THE HD

A. AIR

Compared to water, air quality monitoring has a very robust data set, yet the data, when summarized pollutant-by-pollutant, fails to answer the basic question, “Is the air safe to breathe?” This is what the reader will want to know. It would also be helpful to provide some information about the overall relative risk of various air pollutants and the connections between public health and air quality where they are known or suspected to exist (e.g. asthma).

This chapter could be improved with some fairly simple modifications, such as:

- Regional differences could be acknowledged by highlighting areas of the country that exhibit the most problematic air quality (e.g., ozone non-attainment areas, high particulate matter); some kind of color coding for the ambient air parameters would be helpful in sorting this out;
- The chapter should recognize that only a limited number of parameters are systematically monitored in the US, and the synergistic impacts of multiple air pollutants are not well understood;
- Ozone: The ozone graphic was very difficult to read and to understand. It needs to be rethought. Are the averages for all ozone measurements in the nation averaged together? Are they the average of the highest value at all stations? The graph appears not to match the text about the ozone layer or stratospheric ozone, but rather total ozone levels. The text addresses the thickness of the ozone layer and the graph measures percent change in total ozone levels over time, a confusing use of terms. The graph heading might better read: “Stratospheric ozone began seriously declining in 1979-1993. Since 1993 the ozone layer has improved but is still below naturally occurring levels.”
- Indoor Air: It is unclear if the radon increase in homes is simply because of more testing, especially in areas where high radon levels are suspected, or because there is more radon entering and being concentrated in homes. The HD should provide some explanation for the increase.

- Finally, some conclusions ought to be made with respect to whether air quality is improving. And, given the prominence of the climate change issue in the everyday media, more attention to global air pollution issues would help put the nationwide picture into a larger perspective; this would be particularly helpful for mercury and greenhouse gas emissions.

B. WATER

In general, the chapter on water is well written and is appropriate for a general audience. Where technical terms are used, they are clearly explained. However, the absence of time-series data in many areas (for example, benthic community conditions in wadeable streams and in estuarine waters, or nitrate concentrations in shallow groundwater) is frustrating. *There is no real “story” without a sense of change-over-time.* This may be an unavoidable matter of data gaps, data standards that are set too high, or lack of statistical confidence in the data, but the water chapter suffers from the logical conclusion of a reader that there is no real message. If regional data are available in some areas that are “suggestive” of national trends, more of that could be integrated into the HD – as in the Chesapeake Bay example on p. 14. However, it is important that a reader not be led to conclude that regional trends represent the state of water quality nationwide.

The water section contains frequent statements that no national data are available. This is perplexing, and may raise suspicions on the part of the reader who has been led to believe that water resources is a particularly important topic but now sees there is very little information on it. Readers are likely to view chronic under-reporting or incomplete data sets as evidence that EPA does not place a high value on water resources. NACEPT suggests that a helpful follow-on activity to the Highlights Document and to the overall ROE activity would be the compilation of the most important data gaps, along with suggestions for a process that the Agency – joining with others – can pursue to fill those gaps. As stated on p. 16 of the HD, in the context of recreational waters, “Improved data collection could lead to suitable indicators in several areas.” Where available, EPA should consider the data from TMDL activities and volunteer monitoring. At a minimum, EPA should acknowledge that such data exists.

The document does not provide information on the condition of the nation’s extensive aquifers, yet the continued drawdown of many of them is a very important environmental trend in the nation. Especially with the trend towards higher rates of biofuels and ethanol production, concerns have arisen regarding impacts of increased fertilizer use and irrigation of crops. Like land utilization, the public is consuming water faster than the rate of population growth and much of the increase in water demand is attributable to lawn watering and crop production. The sustainability theme could be easily introduced in this chapter around the issue of groundwater depletion. If unchecked, water-dependent development and farming failures seem likely in several parts of the country over the generation ahead. Especially given the 2007 water crisis in Georgia, if this issue isn’t highlighted, people may well look back and ask “Where was the EPA?” This is a topic where regional information could be used to suggest the seriousness of the issue for the

nation. For example, in parts of Texas, Oklahoma, and Kansas, the Ogallala Aquifer that underlies much of the US Great Plains has already dropped by more than 100 feet and wells are going dry on thousands of farms.

C. LAND

Overall, the chosen information in the HD is consistent with the scientific information in the Technical Document, but the chapter suffers from lack of information and conclusions about land use and land use trends. The lack of consistent, long-term, reliable data, particularly in the land use and land cover sections, is underemphasized in the discussions. Although this is prominently mentioned, a lay reader may not fully understand the consequences of this revelation.

The chapter on land use offers an opportunity for linkage with sustainability and stewardship themes, which this Administration articulates, as well as some linkages between water consumption/water quality and land use. However, the report fails to bring forward the most significant sustainability issues such as, in the chemicals section, the tripling of nutrient fertilizers in the last 40 years. Likewise, the connection between the tripling of fertilizer use and water pollution is lost and should be enunciated (e.g. rising nutrients leading to major eutrophication problems in the Gulf of Mexico, Chesapeake Bay, Long Island Sound, and other water bodies). Nutrients related to agriculture, lawn fertilizers and sewage discharge are the number one problem in our coastal waters and have been for the past 30 years.

The importance of land is very understated at the beginning of the chapter. The regional breakdown is interesting but artificial. It would be more helpful if the importance of land was conveyed in relation to the highly diverse ecosystems (or ecoregions) across the nation. The examples given appear to be from only one or two reports. There are sources of information generated by local, regional and state governments and by organizations such as The Nature Conservancy, for example, that could be very helpful in probing these more local/regional issues. With some additional analysis, which EPA should undertake, these could be more significant than the data upon which this report relies, and would point out threats or improvements to some of the most significant land systems in the US. This would also assist citizen-readers in assessing how to choose their efforts to be most effective, particularly at the local/regional level, where most land use decisions are made.

The conclusion on p. 20 should be highlighted and brought to the beginning of the chapter: “Between 1982 and 2002, the amount of developed land in the US increased at nearly twice the rate of the population [growth].” This is an incredibly alarming statistic that speaks volumes about a prevalent problem: sprawl and the lack of adoption of smart growth principles and policies in the US. The impacts of continued sprawl relate to habitat destruction, energy use, deteriorating air and water quality, and human health.

D. HUMAN HEALTH

The EPA mission “to protect human health and the environment” provides ample rationale for a chapter on human health. However, because this document is designed to highlight a Report on the Environment, it would seem that the focus of this chapter should be on those facets of the environment that have potential to impact human health, and the connections between the two should be emphasized.

While this relationship is discussed in the Chapter (p. 24 “national-level health and exposure indicators cannot be used to demonstrate a cause-and-effect relationship between exposure to an environmental contaminant and an adverse health effect”; p. 25 “such tracking can help identify possible environmental factors that contribute to the diseases or conditions that are the leading causes of death in the United States”; p. 26 “These indicators provide important insights on disease patterns, but cannot be used alone to understand the role of environmental exposures”), all of the statements are equivocal. The ROE instead should strive to be more direct about what EPA and the CDC do know about linkages between environmental conditions and human health.

Based on the examples provided in the health section of the HD, in most cases readers would conclude that the health of the nation is improving. If the purpose of such a conclusion is to encourage the reader to conclude that therefore the nation’s environment is also generally improving, that would be counter to the statement above that such indicators cannot be used to assess impacts of environmental exposure. In fact, other factors such as improved disease diagnosis and health care may be responsible for improved public health. Thus, improvements in public health may not necessarily mean that the environment is improving.

This leads to the question that has been asked before in this NACEPT review: “What is the story?” Is the story that while changes can be seen in nationwide health data, the data available do not allow any conclusions to be drawn about relationships to exposures, or is it something else? Whatever the point of this chapter is, it should be stated more clearly so that readers are not led to erroneous conclusions.

A logical question from a reader may be why does EPA consider exposure to hazardous chemicals a problem if health trends cannot be related to changes in environmental exposure? While such a question clearly understates the complexity of the issue, further discussion in the document about this point would be very valuable in helping the public understand this aspect of the EPA mission and the critical link between environmental quality and public health.

In the Key Points section on p. 26, a few classes of diseases are specifically mentioned. NACEPT suggests that because of the current media interest it would be useful to mention autism in children, as well as the increasing problems of childhood and adult obesity to the extent an argument can be made that the state of the environment may be a contributing factor to these public health issues.

E. ECOLOGICAL CONDITION

The chapter on ecological condition is a good Ecology 101 overview with understandable definitions and descriptions. It presents a clear format and is to the point. The language is appropriate for a general audience, although perhaps at a slightly lower level than necessary. The chapter meets the peer review charge by informing the reader about the importance of environmental issues, making the information meaningful to them and providing a means for the audiences to access more in-depth information. The message is conveyed with good graphs, attractive color illustrations and an appropriate balance and spacing of text and graphics.

The Key Points section on p. 29-33 provides vignettes of ecological indicators, yet the question of “why” for many of them emerges repeatedly. For example, on p. 29 the last paragraph on Key Points states that “much of the information about patterns of ecological systems is more than a decade old, limiting the ability to track recent trends.”

This leads to the question why? Why doesn't EPA continue to monitor ecological condition? Why hasn't EPA sought to obtain and report on data gathered by others? Why doesn't EPA value ecological condition enough to measure it? The same is true on p. 30-33. Here again, the last paragraph of the key points contains embarrassingly repetitive admissions of incomplete and/or inconclusive data. A long explanation is not needed for any of these, but a sentence or two would be helpful.

Examples of what EPA does know about certain ecosystems that have been the focus of strategic initiatives (Great Lakes, habitats of endangered species, Chesapeake Bay, Gulf of Mexico, National Estuaries Program, Okefenokee Swamp, some of our national parks with unique ecosystems) would also illustrate a higher level of commitment to ecological resources. Such examples also could serve as success stories to inspire readers to protect their local or regional ecosystems of concern.

V. EDITORIAL COMMENTS, SUGGESTIONS, AND CLARIFICATIONS

AIR

- p. 5: The overall sum of the toxic pollutants direction is good. Are there some pollutant emissions that are going in the wrong direction?
- p. 5: Second column, top line - Did EPA identify these 188 air toxics or did Congress (in the 1990 Clean Air Act Amendments)? It would be helpful for the chart to indicate how many sites (big difference between 4 and 400).
- p. 6: Are there any large areas where the water has become more acidic?
- p. 6: Second column, last sentence – Should this sentence identify at least a couple of substances that impair visibility? In the Key Points, last line, isn't

opacity a measure used in cities? EPA should strive to transmit to the reader that it fully understands the data and is ready to act on it.

- p. 7: Regarding the mixing of the pollutants worldwide; to what extent do foreign sources contribute to ozone levels in North America? Are there any worldwide trends that are affecting US air quality?
- p. 8: The Key Points do not (but should) differentiate between global and domestic - the concentrations referenced are global and should say so every time - and given the use of global concentration as the measure, global emissions should be referenced after domestic emissions trends.
- Need to highlight when we are addressing emissions and when we are addressing ambient conditions. Consider clearer headings for both.

WATER

- p. 11: Second column, second line - Should it say "more tolerant" rather than "tolerant"? In Key Points, first column, first paragraph, last sentence, the description may not make sense to a reader. "Wadeable streams" is a difficult term for the public to understand, especially as defined. "Wadeable" sounds like shallow enough to sample without a boat. In the top of the next column (and on p. 13), it is not clear what "the extent" means (it appears to have a particular meaning, but it's not provided to the reader).
- p. 11: It is very difficult to see if waters are getting better or worse. Need a bottom line "score" or "code" for chemical, biological, and physical conditions.
- p. 11: Graph uses different terms from those used under Key Points.
- p. 11: "National indicators are not available for many key stressors". What is known?
- p. 11: Second Key Point – Is EPA saying that there is more water now than in the 30's and 40's? Isn't water a finite resource? Or is it the reference to useable or potable water? The statement needs to be revised to make it clear what is intended.
- p. 12: First column, first paragraph, second sentence – Does this mean that global or US groundwater has 30 times the volume as global fresh surface water? In Key Points, first paragraph, the second sentence really leaves the reader hanging – so nearly 50% of all shallow wells tested for concentrations above the human health benchmark? By how much? In the third paragraph, this sounds incomplete at best – don't lots of states and groundwater authorities have information about the water quality of deep aquifers?

- p. 12: Overall, it is hard to believe that these are the only messages that can be gleaned from ground water data sources.
- p. 12: Confusing statement: “47 of 83 pesticides”. What about the other 36 pesticides for which guidelines exist?
- p. 12: First Key Point – If 1% of wells had levels above the human health benchmark, is that good or bad? Where were the wells and how many users did they affect?
- p. 12: Last Key Point - “Such events are not easily captured in measures” is confusing. Perhaps it can be termed “not measurable” or “cannot be measured easily” instead.
- p. 13: In the main text and Key Points, "extent" is used several times – it is not clear exactly what that means here - the data source appears to be one person (T. E. Dahl). If possible, it would be advisable to link an agency or organization to that single source.
- p. 13: How good are the acreage data? At one time there were some significant questions regarding the accuracy of these estimates.
- p. 13: Last sentence in the second paragraph: “Gains can occur”- seems a little redundant after saying ...“cause of wetland loss” therefore additional elaboration is suggested.
- p. 13: It would be good to know why the trend in wetland acreage is changing for the better.
- p. 14: How representative of all coastal areas are those sampled? Also, is the 70% figure inconsistent with the “wadeable streams” data on page 11? It seems counter intuitive that the benthic communities in the streams are in such poor shape and those in the estuaries are in such good shape. At a minimum, the seeming inconsistency should be explained.
- p. 14: At the bottom of the left-side column on Key Points, in talking about the Gulf of Mexico “dead zone,” it states that “substantial areas of hypoxia...remain.” This language may unintentionally give the impression that hypoxia was a major problem in the past, it’s improving, but some substantial parts remain. However, isn’t hypoxia a worsening problem in the Gulf rather than the “remainder” of a largely resolved problem?
- p. 14: While there are no national indicators for the condition of coral reefs, this is another problem area where regional data could be used to indicate its potential seriousness. For example, Florida’s coral reefs are already in serious decline. Recently both Elkhorn and Staghorn Caribbean coral were added to the list of threatened species under the Endangered Species Act. Both species have declined by 97 percent since the late 1970s.
- p. 16: Recreational Waters: This is the weakest topic, yet one in which the public may have great interest. Stating that EPA just can't possibly discuss beach water conditions is hard to fathom. EPA talks about beach water quality all the time, issues reports, gives grants, partners with states and NGOs, etc. If it really is true

- that EPA can't discuss such conditions in a scientifically defensible manner, the ROE should at least reference the information that does exist and where the reader can find that information. There may be value in a discussion of how EPA must use data that is not as scientifically valid as desired in order to make rapid decisions, if this is the reason for lack of data in this case. Could state data be used in a suggestive way to illustrate the mixed picture or even to give a sense of the overall direction of change over the past generation?
- p. 16, p. 17: In Key Points, first and second paragraphs, the last sentence's disclaimer about how all EPA's work failed to focus on the most important (known) areas makes EPA sound problematic or misguided. Is EPA going to survey those areas next year? Is there any information/data EPA could use here? Further explanation in this area would be very helpful.

HUMAN HEALTH

- p. 17: Should the report draw on FDA or USDA data to “round out” the picture? Also, people will want to know “is our nation’s seafood safe to eat?” This page does not answer that important question. Consumable Fish and Shellfish: Should there be a “key point” related to the rapid growth and impacts of aquaculture?
- p. 22: First column, second paragraph: Isn't volume or mass proportional to toxicity sometimes? Maybe EPA could just insert "necessarily" between "not" and "proportional".
- p. 23: In the Key Points first paragraph and chart, is it intended that the reader should conclude that it is likely that at 20% of all Superfund sites people are exposed to contamination above health-based standards?
- p. 25, 26, and 27: Health status Key Points: The rosy picture that’s painted in the opening statement, that overall health is improving, isn't really supported by the information and data that follow.
- p. 25: Suggest changing "health" to "lifespan" in the opening bold-faced statement under Key Points (Of course, lifespan can be greatly influenced by medical advancements and may not be a function of environmental improvements. This should be more clearly explained). Likely both lifespan and health should be cited. As an example, the incidence certain cancers is decreasing and survival rates are increasing – which speaks both to health and lifespan.
- p. 25: Mortality needs to be defined for the public.
- p. 25: In the chart, is the horizontal set of dates the dates in which people are born and their life expectancy as of that date? Do life expectancies change over time (after people are born)?

ECOLOGICAL CONDITION

- p. 29: In column 1, first paragraph, "extent" is used here, too, with no definition. In the second column, first full paragraph, EPA may want to edit the first sentence

so it doesn't sound like EPA believes climate change is all natural (it doesn't say that, but some will read it that way). In Key Points, fragmentation is used as the sole barometer of the forest's health - Are there any other indicators (or studies looking at disease, etc.)? Why are forests picked as the sole example, rather than looking at wetlands or prairies or some other system, as well?

- p. 29: The Pine Beetle infestation in the West is a major pattern in forest ecological conditions and is creating fragmentation, increased fuel loading, and a change in the forest type. Perhaps this should be noted in this section or perhaps in the Diversity section.
- p. 29: Key Points, first paragraph, provide an example after ..."development patterns".
- p. 30: Line 6 of the first paragraph of Key Points, an example of some of the native fish loss would be beneficial.
- p. 30: Last paragraph on Biological Diversity, date of the lamprey introduction and reasons why sweeping changes occurred in the food web should be added.
- p. 30: In Key Points, first column, second paragraph, is the document talking about native bird populations, including increases and decreases, or just total numbers of all birds? EPA should reference the work that the Department of Interior does on endangered species (rather than saying that EPA doesn't have consistent national indicators for any other types of animals).
- p. 31: The chart is hard to read - maybe easier if it is redone to compare north to north across the time periods, and then look to south to south across the time periods - now, the reader has to jump back and forth to see how each region did.
- p. 32: In Key Points, lots of readers will focus on the first paragraph. Are the trends noted here global or US only?
- p. 33: In Key Points, is ozone pollution an example of bioaccumulation? If so it should be explained. Most people don't picture ozone accumulating inside a plant or causing problems when an animal eats it - should the fish tissue paragraph also note that humans may be impacted?
- p. 34: The last sentence of the first paragraph in the section titled "About the Indicators" should start out "A subset of these", by adding the word "of".

APPENDIX A: NACEPT Report on the Environment Workgroup Members

Workgroup Members

Jeff Crane

Executive Director

Colorado Watershed Assembly

Carolyn Green

Vice-President

Health, Environment and Safety

Regulatory Affairs

Sunoco, Inc.

Stan Laskowski

Lecturer/Advisor

Master of Environmental Studies Program

University of Pennsylvania

Arleen O'Donnell (*Co-Chair)

Board of Directors

Massachusetts Environmental Trust

Bob Olson

Senior Fellow

Institute for Alternative Futures

Bradley Smith

Dean

Huxley College of the Environment

Western Washington University

Victoria Tschinkel

Executive Committee Member

1000 Friends of Florida

Dan Watts (*Co-Chair)

Executive Director

York Center for Environmental

Engineering & Science

New Jersey Institute of Technology

Workgroup Members from the Science Advisory Board (SAB)

George Lambert

Associate Professor of Pediatrics
Director, Center for Childhood Neurotoxicology
Robert Wood Johnson Medical School-UMDNJ

Robert Twiss

Professor of Environmental Planning Emeritus
University of California-Berkeley

NACEPT Chair

John Howard

Partner
Vinson & Elkins, LLP

NACEPT Designated Federal Officer

Sonia Altieri

Office of Cooperative Environmental Management (OCEM)
U.S. Environmental Protection Agency

APPENDIX B: NACEPT CHARGE

Peer Review Charge for *EPA's 2007 Report on the Environment: Highlights of Conditions and Trends*

The U.S. Environmental Protection Agency (EPA) has asked independent peer reviewers to critically review *EPA's 2007 Report on the Environment Highlights of Conditions and Trends* (Highlights Document or HD). Reviewers are asked to evaluate if the HD is an appropriate distillation of *EPA's 2007 Report on the Environment Technical Document* (Technical Document or TD) and if the HD is presented effectively for the target audience.

The purpose of the Highlights Document is to present national status and trends in the environment and human health in a clear, engaging manner to a public audience of "civic-minded individuals." The HD should inform the audience about important environmental issues, make the information meaningful to them, and provide a means for the audience to access more in-depth information.

The Agency's approach to these issues was informed by the overall purpose of the Report on the Environment (ROE), the nature of the TD as its source document, and by feedback on an earlier publication, the *Draft Report on the Environment Public Document 2003* (PD03).

Using the guidance in **Section 1** and the more detailed background information in **Section 2** (pp. 2-5), please address the three peer review charge questions. Please become familiar with the HD's scope and layout so you can adequately address charge question 2.

Section 1: Charge Questions and Review Materials

The draft Highlights Document is being reviewed for content in the following important areas:

- Scientific accuracy and alignment with the Technical Document.
- Presentation to the target audience.

The following materials are provided:

Review Document

- Draft Highlights Document

Background Materials

- ROE07 Technical Document.

- Attachment A to the Charge: ROE07 Indicator Definition and Criteria.
- Attachment B to the Charge: ROE07 Questions and Supporting Indicators.

The first charge question is directed to SAB reviewers who are also reviewing the Technical Document. Questions 2 and 3 are to be answered by all reviewers. Considering the background information provided in Section 2 below, please read the review document and respond to the following questions:

SAB reviewers:

1. Does the Highlights Document accurately represent the scientific content of the Technical Document? Are key areas over- or under-represented? Would someone familiar with both documents come to the same conclusions regarding human health and the state of the nation's environment?

All reviewers:

2. The Highlights Document distills the information found in the Technical Document. Is the Highlights Document scientifically accurate? What conclusions would one come to regarding human health and the state of the nation's environment?

3. Is the information in the Highlights Document presented in a way that is understandable to the target audience? Are the structure and length of the Highlights Document appropriate for its content and the target audience? How could the presentation be improved?

Section 2: Background

Purpose of EPA's 2007 Report on the Environment

EPA's *Report on the Environment 2007* (ROE07) consists of three products:

1. A Technical Document written for environmental professionals. This document forms the scientific basis of all three products.
2. A Highlights Document written for civic-minded individuals.
3. An electronic Report on the Environment that facilitates access to the data and their sources.

The purpose of ROE07 is to answer questions that the Agency believes best reflect its mission to protect human health and the environment. To the extent possible, this is accomplished using a suite of indicators that have been subjected to rigorous peer review. The ROE07 summarizes and communicates what is known and not known about the current status and trends in the condition of air, water, land, human health, and ecological systems in the nation. EPA intends to use this information to inform its strategic planning and decision-making.

A fundamental premise of the ROE is that it uses only peer-reviewed indicators to answer the questions. Though many other environmental data sources, publications, and site-specific research projects are available, the ROE intentionally uses only indicators that rely on physical, chemical, and biological measurements to monitor trends in condition over time.

Further, the 2007 ROE focuses on national-level indicators. National indicators address ROE questions at national as opposed to regional or local scales and thus provide a broad and relatively coarse picture of condition.

ROE Review

In 2003, EPA released its first ROE, the *Draft Report on the Environment 2003* (DROE03), which consisted of a Public Document (PD03) and a Technical Document. Both documents were reviewed by EPA's Science Advisory Board and national "dialog sessions" were held in six cities to receive comments on the report's utility and to obtain feedback on how to improve future reports. EPA then developed the updated Technical Document and Highlights Document currently under review.

The indicators in the 2007 ROE Technical Document were reviewed by external scientists in 2005 and the entire draft TD will be reviewed by EPA's Science Advisory Board. In addition, drafts of the 2007 ROE Highlights Document were reviewed by EPA and by other federal agencies. The HD has incorporated the results of these reviews to create the present document.

Development of the ROE07 Technical Document

Questions. A series of 23 important questions concerning trends in the condition of the environment and human health have been developed and form the structural basis of the report. The questions focus not only on EPA's current regulatory and program activities, but also on issues clearly related to EPA's mission to protect human health and the environment. The questions should be answered as fully as possible if EPA is to be adequately informed about important environmental trends. However, it is recognized that the questions cannot be answered completely based on the available data.

Indicators. The questions are answered using indicators that meet an explicit definition and a set of criteria (see Attachment A). These indicators come from a number of sources, including the DROE03, EPA, other federal agencies, and non-profit organizations. All proposed indicators were screened for their ability to pass a peer review based on the indicator definition and criteria. Based on the peer reviewer recommendations, some indicators were dropped from further consideration and others were revised for inclusion in the Technical Document. The final set of indicators is listed in Attachment B.

Other Elements of the TD. The questions and their associated indicators are presented in five main chapters of the TD; Air, Water, Land, Human Health, and Ecological

Condition. The text for each question describes the scope of the question, presents the indicators used to answer the question, and summarizes the “answer” that the available indicators provide to the question, along with limitations and gaps (i.e., where no indicators meeting the criteria are currently available to answer important aspects of the question). The TD also includes an introduction and several appendices.

Development of the Highlights Document

In developing the HD, EPA has benefited from feedback from several groups, including EPA's Science Advisory Board, the National Advisory Council for Environmental Policy and Technology, the Local Government Advisory Committee, and a series of national dialog sessions in 2003 and 2004.

Audience

The target audience for the 2007 Highlights Document is "civic-minded individuals," which is a subset of the population that has some interest and knowledge of the environment and is likely to seek environmental information. Civic-minded individuals include members of civic or community groups, members of environmental groups, parents, students, educators, and local decision-makers. In addition, there are secondary audiences for the HD who are not environmental or health professionals, but are likely to use the HD rather than the TD for professional purposes. Examples of these audiences include the media, policymakers, industry, and real estate professionals.

This target audience is deliberately narrower than the PD03 target audience of the "educated layperson." This change was made in response to feedback which encouraged EPA to design the HD for a more tailored audience and to make the HD considerably shorter than the PD03. By targeting the civic-minded individual, the HD is likely to appeal to the individuals it is most likely to reach, rather than a broad general public audience, most of whom have limited interest in the material. In other words, the HD is targeted to those who will read it, rather than those who will not. If the HD targeted a broader audience, the informed readers would need to wade through long explanations of basic concepts before reaching the information they seek, and assume that the HD is not for them.

Purpose

EPA received comments from multiple venues indicating that the HD would be more effective if its purpose was defined more precisely. Reviewers suggested that without certain revisions in the Highlights Document, EPA would miss an opportunity to engage and educate Americans on the state of the environment. Based on this feedback and considering the needs of the target audience, EPA proposed three purposes for the Highlights Document:

1. Describe the highlights in conditions and trends in the environment and human health.
2. Inform the audience about important environmental issues and make the information meaningful to them.
3. Provide a means for the audience to delve deeper into environmental indicators and information.

The first purpose is central to the ROE as a whole and includes the key point, as does the TD, that EPA's ability to describe conditions and trends in many areas is limited by incomplete information. The second purpose for the HD is to inform the public about important environmental issues and increase the level of environmental literacy. The third purpose is to provide a means for the audience to learn more about indicators and environmental and health issues. Given the goal of creating a shorter HD, the document could not provide details about any single topic. However, it should whet readers' appetites and direct them to more detailed information in the 2007 TD and the e-ROE.

Length

The PD03 was 160 pages long. Groups and individuals commenting on the PD03 clearly recommended that the next version be much shorter. The ROE07 TD presents indicators to address the 23 questions and is organized into five chapters (see Attachment B). The HD is similarly organized, with one exception. The Outdoor Air question of the TD was divided into three parts in the HD (Outdoor Air, Acid Rain and Regional Haze, and Ozone Depletion) because in the TD this question includes more than 25 indicators. To keep the HD brief, each topic is allocated a single page.

Content

Each page provides background information and summarizes the status and trends based on the available indicators, while also acknowledging indicator gaps and limitations. Each page also includes a graphic to illustrate one of the indicators.

A basic premise of the ROE07 HD was that its scientific content would be derived entirely from the Technical Document. In order to distill the large quantity of information in the TD into a short HD, EPA highlighted indicators for each topic using several criteria:

- Scientific importance,
- Importance to civic-minded individuals,•
- Degree to which the indicator contributes to answering the ROE question,••
- Degree to which there are significant changes in trends in recent years, and••
- New indicator.

This information is shown in bulleted form on each topic page.

ATTACHMENTS A AND B OF THE CHARGE TO NACEPT

ATTACHMENT A: ROE07 INDICATOR DEFINITION AND CRITERIA

Indicator Definition

A numerical value derived from actual measurements of a pressure, ambient condition, exposure, or human health or ecological condition over a specified geographic domain, whose trends over time represent or draw attention to underlying trends in the condition of the environment. Indicators and their underlying data must meet criteria (see box below) for data quality, comparability, representativeness, and adequate coverage in time and space. Note that indicators rely on an underlying database or set of databases, but the databases themselves are not indicators.

Indicator Criteria

- 1) The indicator makes an important contribution to answering a question for the ROE. (In this context, “important” means that the indicator answers a substantial portion of and/or a critical part of the question.)
- 2) The indicator is objective. It is developed and presented in an accurate, clear, complete, and unbiased manner.
- 3) The underlying data are characterized by sound collection methodologies, data management systems that protect their integrity, and quality assurance procedures.
- 4) Data are available to describe changes or trends, and the latest available data are timely.
- 5) The data are comparable across time and space, and representative of the target population. Trends depicted in this indicator accurately represent the underlying trends in the target population.
- 6) The indicator is transparent and reproducible. The specific data used and the specific assumptions, analytic methods, and statistical procedures employed are clearly stated.

ATTACHMENT B: ROE07 QUESTIONS AND SUPPORTING INDICATORS

Air

Outdoor Air

What are the trends in outdoor air quality and their effects on human health and the environment?

Carbon Monoxide Emissions; Ambient Concentrations of Carbon Monoxide; Lead Emissions;

Ambient Concentrations of Lead; Nitrogen Oxides Emissions; Ambient Concentrations of Nitrogen Dioxide; Volatile Organic Compound Emissions; Ambient Concentrations of Ozone; Ozone Injury to Forest Plants; Particulate Matter Emissions; Ambient Concentrations of Particulate Matter (PM); Sulfur Dioxide Emissions; Percent of Days with Air Quality Index Values > 100 ; Mercury Emissions; Air Toxics Emissions; Ambient Concentrations of Benzene; Ozone and PM Concentrations for U.S. Counties in the U.S./Mexico Border Region; Ambient Concentrations of Manganese Compounds in EPA Region 5

Acid Rain and Regional Haze

What are the trends in outdoor air quality and their effects on human health and the environment?

Nitrogen Oxides Emissions; Regional Haze; Sulfur Dioxide Emissions; Acid Deposition; Lake and Stream Acidity; Particulate Matter Emissions

Ozone Depletion

What are the trends in outdoor air quality and their effects on human health and the environment?

Concentrations of Ozone-Depleting Substances; Ozone Levels over North America

Greenhouse Gases

What are the trends in greenhouse gas emissions and concentrations?

U.S. Greenhouse Gas Emissions; Atmospheric Concentrations of Greenhouse Gases

Indoor Air

What are the trends in indoor air quality and their effects on human health?

U.S. Homes Above EPA's Radon Action Levels; Blood Cotinine Level

Water

Fresh Surface Waters

What are the trends in extent and condition of fresh surface waters and their effects on human health and the environment?

High and Low Stream Flows; Streambed Stability in Wadeable Streams; Nitrogen and Phosphorus in Wadeable Streams; Nitrogen and Phosphorus in Streams in Agricultural Watersheds; Nitrogen and Phosphorus Discharge from Large Rivers; Pesticides in Streams in Agricultural Watersheds; Benthic Macroinvertebrates in Wadeable Streams; Lake and Stream Acidity

Ground Water

What are the trends in extent and condition of ground water and their effects on human health and the environment?

Nitrate and Pesticides in Ground Water in Agricultural Watersheds

Wetlands

What are the trends in extent and condition of wetlands and their effects on human health and the environment?

Wetland Extent, Change, and Sources of Change

Coastal Waters

What are the trends in extent and condition of coastal waters and their effects on human health and the environment?

Coastal Water Quality; Coastal Sediment Quality; Coastal Benthic Communities; Submerged Aquatic Vegetation in Chesapeake Bay; Hypoxia in the Gulf of Mexico and Long Island Sound; Harmful Algal Blooms along the Western Florida Coastline; Coastal Fish Tissue Contaminants; Wetland Extent, Change, and Sources of Change

Drinking Water

What are the trends in the quality of drinking water and their effects on human health?

Population Served by Community Water Systems with No Reported Violations of Health-Based Standards

Recreational Waters

What are the trends in the condition of recreational waters and their effects on human health and the environment?

There are currently no national indicators available for this topic.

Consumable Fish and Shellfish

What are the trends in the condition of consumable fish and shellfish and their effects on human health?

Coastal Fish Tissue Contaminants; Contaminants in Lake Fish Tissue

Land

Land Cover

What are the trends in land cover and their effects on human health and the environment?

Land Cover; Land Cover in the Puget Sound/Georgia Basin; Forest Extent and Type

Land Use

What are the trends in land use and their effects on human health and the environment?

Land Use; Urbanization and Population Change

Wastes and the Environment

What are the trends in wastes and their effects on human health and the environment?

Quantity of Municipal Solid Waste Generated and Managed; Quantity of RCRA Hazardous Waste Generated and Managed

Chemicals Applied and Released to Land

What are the trends in chemicals used on the land and their effects on human health and the environment?

Fertilizer Applied for Agricultural Purposes; Toxic Chemicals in Production-Related Wastes Released, Treated, Recycled, or Recovered for Energy Use; Pesticide Residues in Food; Reported Pesticide Incidents

Contaminated Land

What are the trends in contaminated land and their effects on human health and the environment?

High-Priority Cleanup Sites with No Human Contact to Contamination In Excess of Health-Based Standards; High-Priority Cleanup Sites Where Contaminated Ground Water Is Not Continuing to Spread Above Levels of Concern

Human Health

Health Status

What are the trends in human health status in the United States?

General Mortality; Life Expectancy at Birth; Infant Mortality

Diseases and Health Conditions

What are the trends in human disease and conditions for which environmental pollutants may be a risk factor, including across population subgroups and geographic regions?

Cancer Incidence; Cardiovascular Disease Prevalence and Mortality; Chronic Obstructive Pulmonary Disease Prevalence and Mortality; Asthma Prevalence; Infectious Diseases Associated with Environmental Exposures or Conditions; Childhood Cancer Incidence; Birth Defects Rates and Mortality; Low Birthweight; Preterm Delivery

Exposure to Environmental Contaminants

What are the trends in human exposure to environmental contaminants including across population subgroups and geographic regions?

Blood Lead Level; Blood Mercury Level; Blood Cadmium Level; Blood Cotinine Level; Blood Persistent Organic Pollutants (POPs) Level; Urinary Pesticide Level; Urinary Phthalate Level

Ecological Condition

Patterns in Ecological Systems

What are the trends in the extent and distribution of the nation's ecological systems?

Forest Extent and Type; Forest Fragmentation; Ecological Connectivity in EPA Region 4; Relative Ecological Condition of Undeveloped Land in EPA Region 5; Land Cover; Land Use; Urbanization and Population Change; Wetland Extent, Change, and Sources of Change; Land Cover in the Puget Sound Basin

Biological Diversity

What are the trends in the diversity and biological balance of the nation's ecological systems?

Bird Populations; Fish Faunal Intactness; Non-Indigenous Estuarine Species in Pacific Northwest; Coastal Benthic Communities; Harmful Algal Bloom Outbreaks along the Western Florida Coastline; Submerged Aquatic Vegetation in Chesapeake Bay; Benthic Macroinvertebrates in Wadeable Streams

Ecological Processes

What are the trends in the ecological processes that sustain the nation's ecological systems?

Carbon Storage in Forests; Ecological Connectivity in EPA Region 4

Physical and Chemical Attributes of Ecological Systems

What are the trends in the critical physical and chemical attributes and processes of the nation's ecological systems?

U.S. and Global Mean Temperature and Precipitation; Sea Surface Temperature; Sea Level; High and Low Stream Flows; Lake and Stream Acidity; Nitrogen and Phosphorus Discharge from Large Rivers; Nitrogen and Phosphorus in Streams in Agricultural Watersheds; Nitrogen and Phosphorus in Wadeable Streams; Streambed Stability in Wadeable Streams; Hypoxia in the Gulf of Mexico and Long Island Sound

Ecological Exposure to Contaminants

What are the trends in biomeasures of exposure to common environmental pollutants in plants and animals?

Coastal Fish Tissue Contaminants; Contaminants in Lake Fish Tissue; Ozone Injury to Forest Plants